Land Records and
Agriculture, Bengal,
annual report
1889-90; 1890-91; and
1892-93

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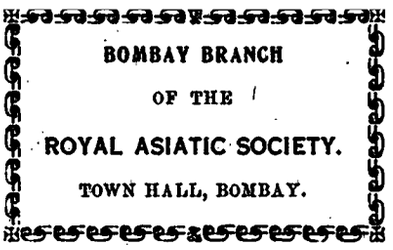

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ANNUAL REPORT

OF THE

DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

BENGAL;

FOR THE YEAR 1889-90.

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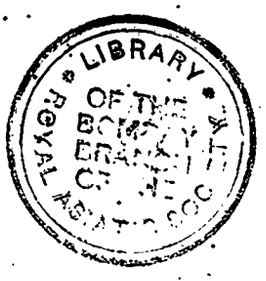

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OFFICE OF DIRECTOR OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BENGAL.

No. 1672*Agri.*

FROM M. FINUCANE, ESQ., C.S.,

Director of the Department of Land Records and Agriculture, Bengal,

TO THE SECRETARY TO THE GOVERNMENT OF BENGAL,

REVENUE DEPARTMENT.

[THROUGH THE BOARD OF REVENUE, L.P.].

Calcutta, the 31*st July* 1890.

SIR,

I HAVE the honour to submit the Annual Report of the Department of Land Records and Agriculture in Bengal for the year 1889-90.

2. I was in charge of the Department during the year.

3. The duties of the Department of Land Records and Agriculture, in Bengal, fall under two main heads—*first* and chiefly those connected with surveys, settlements of land revenue and of rents, organization and maintenance of land records; and *secondly*, those connected with agricultural enquiry and improvement, and collection of agricultural statistics. Looked at from the first point of view, the Department occupies the position held by Settlement Departments in the North-Western Provinces, Bombay and Madras, and differs from the Agricultural Departments of some of the other provinces, in this respect, that instead of being primarily engaged in the supervision of the maintenance of records already prepared by the Settlement Department, it is chiefly engaged for the present, and must for some years to come be engaged, as regards this branch of its duties, in the preparation of settlement records themselves, which may be said to have hitherto been almost entirely wanting in these provinces. In the work connected with agricultural enquiry, improvement and collection of agricultural statistics, two Cirencester graduates —Messrs. Basu and Banerjee—were employed: the former for the whole and the latter for four months of the year.

CHAPTER I.

PREPARATION OF LAND RECORDS, SURVEYS, SETTLEMENTS, MAINTENANCE OF VILLAGE RECORDS.

4. There were 83 estates* containing an area of 7,285 square miles, in 20 separate districts under survey and settlement operations, during the year. Of these, 51 are Government estates, with an area of 4,294 square miles, of which a resettlement of land revenue is being made; 9 are Wards' estates, with a total area of 2,868 square miles, of which a survey, with a record of rights and settlement of fair rents has been undertaken; and 23 are private zemindars' estates, with an area of 123 square miles, the owners of which applied for survey, record of rights and settlement of rents, either on the ground of disputes existing between them and their tenants, or on the ground that they were new auction-purchasers and unable to ascertain the amounts of the rentals payable to them.

5. The statement A given in the appendix will show at a glance the progress made and the cost of the operations in the principal estates under survey and settlement. The period for which report has to be submitted, in order to suit the Board's requirements, namely, the financial year, is very inconvenient, as the survey and settlement year begins with the beginning of the cold weather and

* The word "estates" is here used in the sense of separate properties, not in the technical sense, according to which every area, with a separate towjee number, is an estate. Each of these properties includes many "estates" in the latter sense.

ends in October. The result is that the progress of operations of parts of two survey years are shown in one financial year—a circumstance which makes it difficult to ascertain the exact area surveyed within the financial year, and the precise cost of survey or settlement per acre, and renders it impossible to obtain index maps from the Survey Department, before submission of the report. The cost of surveys and settlements shown in any one year cannot for this reason, until the whole work of each separate area is completed, be taken as showing what the total average cost per acre will be when the work is completed. Hence also apparent variations are shown in the rate of cost, but these variations become equalised on completion of each separate local area.

Angul.

6. This is a Government estate, of which the term of settlement has expired. The total area of it, including hills and forests, is 881 square miles, of which 538 square miles, comprised in 627 villages, were found to be wholly or partially cultivated and were cadastrally surveyed, the remainder being under reserved forests and waste. The survey was completed last year, mainly by indigenous agency of trained surbarakars, under the supervision of the Survey Department, at a total cost of Rs. 1,02,357, or annas 4-10 per acre, on the area cadastrally surveyed. A topographical survey was made of the forests and waste lands.

7. *Settlement.*—The last settlement of the Angul estate was made in 1855, shortly after the estate was confiscated. Certain rates were then adopted for certain classes of soil, and rentals were calculated at those rates, on the areas found at that time under cultivation, and for fallow land in the occupation of raiyats. The sarbarakars (village headmen) were allowed to enjoy the profits arising from extension of cultivation during the currency of the settlement, and they collected from the raiyats and appropriated to themselves the rents of newly-cultivated land during the past 35 years.

The area under cultivation at the time of the last settlement was 50,081 acres; the area now found by measurement to be under cultivation is 133,742 acres. The rates adopted at the settlement of 1855 were—

	Average.			
	Rs.	A.	P.	
For rice lands	1	7	2	per acre.
„ bazifasl (cultivated upland) ...	1	2	3	„
„ toila (newly-cultivated land) ...	0	4	0	„
„ sugarcane lands	3	2	0	„
„ homestead	3	0	0	„

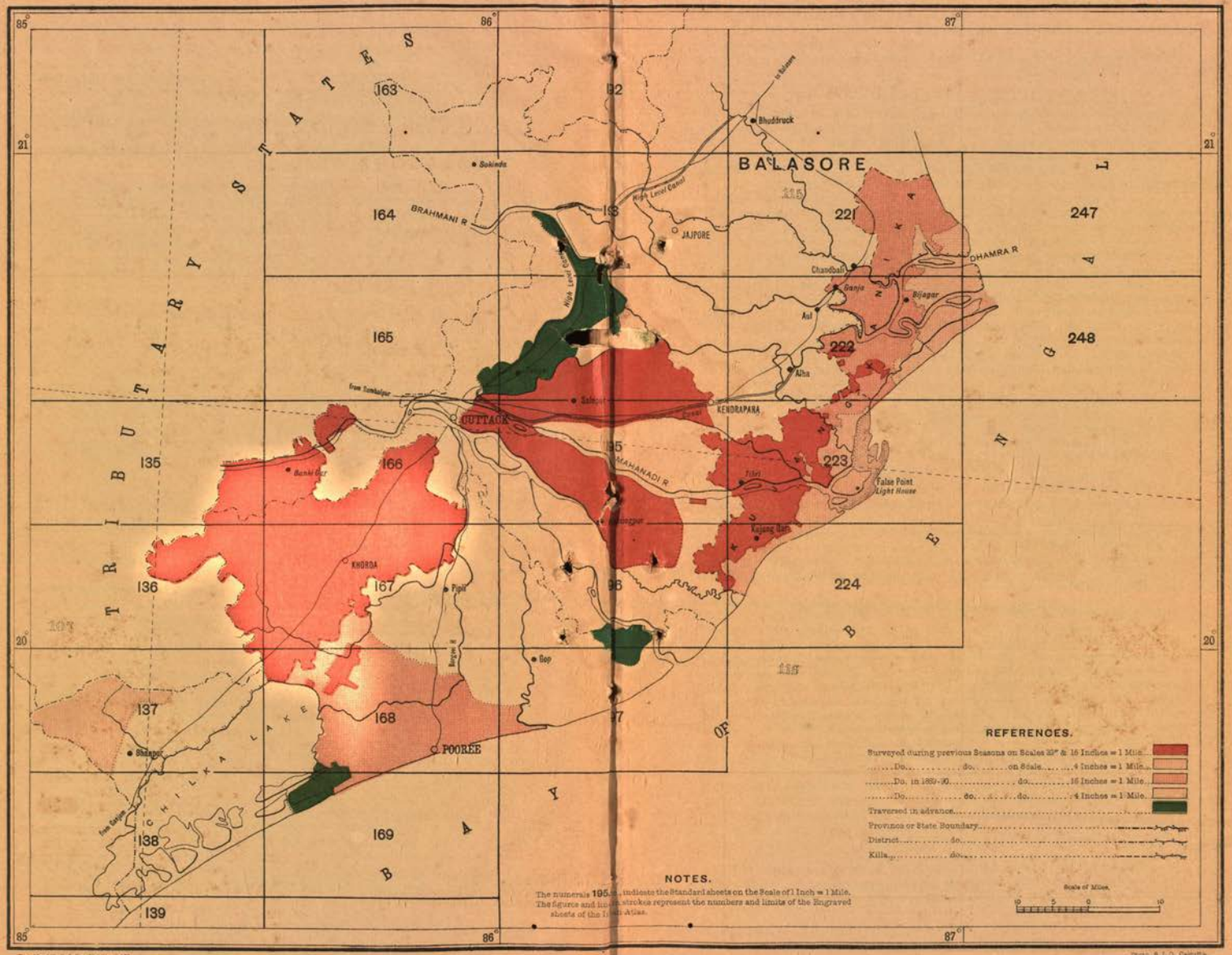
It is impossible to say what rise in prices took place during the currency of the last settlement, but it is evident that the increase must have been considerable, and that a still further increase is likely to take place in the immediate future owing to improved facilities for communication. It was therefore thought to be out of the question to make any reduction in the rates fixed 35 years ago, while, on the other hand, the application of the existing rates, to the areas now found by survey to be under cultivation, would result in trebling the revenue hitherto paid by the sarbarakars to Government. Though this increase in the revenue payable to Government by the sarbarakars does not represent a corresponding increase in the rents payable by the raiyats to them, yet it was considered by Government that a sudden increase from a revenue of Rs. 36,898 to one of about Rs. 1,10,000, even though the rates were not enhanced, was more than the raiyats and sarbarakars can bear. It has accordingly been proposed that lands under cultivation at the time of the last settlement be assessed at the rates adopted at that settlement, and that lands since brought under cultivation be assessed at half rates for five years, at three-quarter rates for the following five years, and then at full rates. These proposals have recently been accepted by Government, and the raiyats and sarbarakars, it is reported, are also willing to accept them. The result of the adoption of them will be an increase of revenue of about Rs. 37,000 per annum for the first five years, Rs. 55,000 for the following five years, and afterwards Rs. 74,000.

8. *Cost of settlement.*—The total cost of the preparation of the record of rights and settlement of rents to the end of March was Rs. 40,363, or annas 1-10 per acre.

BENGAL SURVEY.

INDEX TO THE CADASTRAL SURVEY OF ORISSA, DISTRICTS CUTTACK & POOREE.

No. 8 PARTY.



Reg. No. 307, S. I. D.—10-8-93.—1,000.

Photo., S. I. O., Calcutta.

The total cost to the end of March of survey and settlement, was Rs. 1,42,720, against a total estimate of Rs. 2,50,000 originally sanctioned by the Government of India.

The number and classification of tenants will be found in the appendix B.

Banki.

9. This estate, which came under direct management of Government in 1843, was brought under survey and settlement in 1887, because of the expiration of the term of the previous settlement. The survey was completed last year under the supervision of the Survey Department, through the agency of local sarbarakars, at a cost of Rs. 24,674, or annas 5-1 per acre.

10. The total area of the estate is 120 square miles, of which 35,500 acres are under cultivation. The net revenue payable by the sarbarakars to Government was Rs. 21,368, giving an average all-round assessment of 12 annas per acre. The last settlement was made in 1853, and prices have more than doubled since that time; but it was considered inexpedient to enhance the existing rates, and it was ordered that an increase of revenue should only be looked for by the assessment of excess lands, that is, lands brought under cultivation during the currency of the last settlement. Thirty-three villages were assessed, and the jamabandis were explained to, and accepted by, the raiyats and sarbarakars concerned, with the result that the revenue payable to Government in these villages has increased from Rs. 4,453 to Rs. 5,823, or by 17·4 per cent. An increase of Rs. 5,000 per annum is expected on the entire estate. The total cost of settlement to the end of March was Rs. 8,018. The completion of the settlement will, it is reported, cost Rs. 4,000, more so that the total cost of survey and settlement will be—

	Rs.	
Survey	24,674	
Settlement	12,018	
Total ...	36,692	= annas 7½ an acre.

This sum has been met from savings in the estimate for Angul, and is about one-fourth of the expenditure at first proposed by the local authorities for a non-professional survey.

11. The assessment is extremely moderate, for, as the records of the Registration office show, raiyati holdings in this estate sell from Rs. 50 to Rs. 200 per acre. The number and classification of tenants will, as in the case of other estates, be found in the appendix B.

General Survey and Re-settlement of Orissa.

12. The greater part of the province of Orissa is temporarily settled. The last general settlement, after detailed investigation into the circumstances of the province, was made for 30 years in 1836-37. This settlement expired in the famine year 1866-67, but as Government felt that it would be inexpedient to increase the land revenue of the province at that time, the settlement was renewed without enhancement for 30 years. The term of the present settlement will, therefore, expire in 1896-97. For this reason it has become necessary to undertake the survey and the preparation of a record of rights, with a view to the re-settlement of revenue. A scheme was submitted during the year for the conduct of the survey through indigenous agency, under the supervision of the Survey Department, and for the preparation of a record of rights under a settlement officer. This scheme has been approved by Government. The cost of survey and settlement is estimated at about fifteen lakhs of rupees, and the increase of revenue at seven lakhs or more.

POOREE ESTATES.

13. *Survey.*—As part of the scheme of the general survey of Orissa, the measurement of pergunnahs Rohang, Sarai, and Chowbiskood, which mainly consist of Government estates, was undertaken last cold weather. The total

area, of which traverse survey was completed, was 407 square miles, the area cadastrally surveyed was 358 square miles, the total cost to the end of March was Rs. 24,872 and to the end of May 1890, was, it is reported, Rs. 47,130, or $3\frac{1}{4}$ annas per acre.

14. *Settlement.*—Mr. A. K. Raye was, pending the appointment of a settlement officer, appointed to be Assistant Settlement Officer, in order to assist the survey officers in the demarcation of boundaries and settlement of disputes. No records were received from the Survey Department, and no settlement work proper could therefore be done. The expenditure incurred in connection with settlement charges was Rs. 2,002 to the end of May 1890.

15. The traverse survey in Pooree was extended to pergunnahs Lembai, Kot Rohang, and Kotdesh. A traverse survey has also been made of 127 square miles in certain tracts, irrigated from canals in Cuttack, which will be surveyed cadastrally next cold weather.

16. *Training of Local Agency for the conduct of survey in Orissa.*—Survey training schools were opened at Tangi and Barebana in Cuttack, and 115 pupils passed through and were reported by Mr. Patterson, the Deputy Superintendent of Survey, to be competent to carry on work of survey next season. Mr. Patterson also reports that a number of pupils can be obtained and passed through the schools by next cold weather, sufficient for the requirements of the Survey Department.

The Western Dooars of Julpigoree.

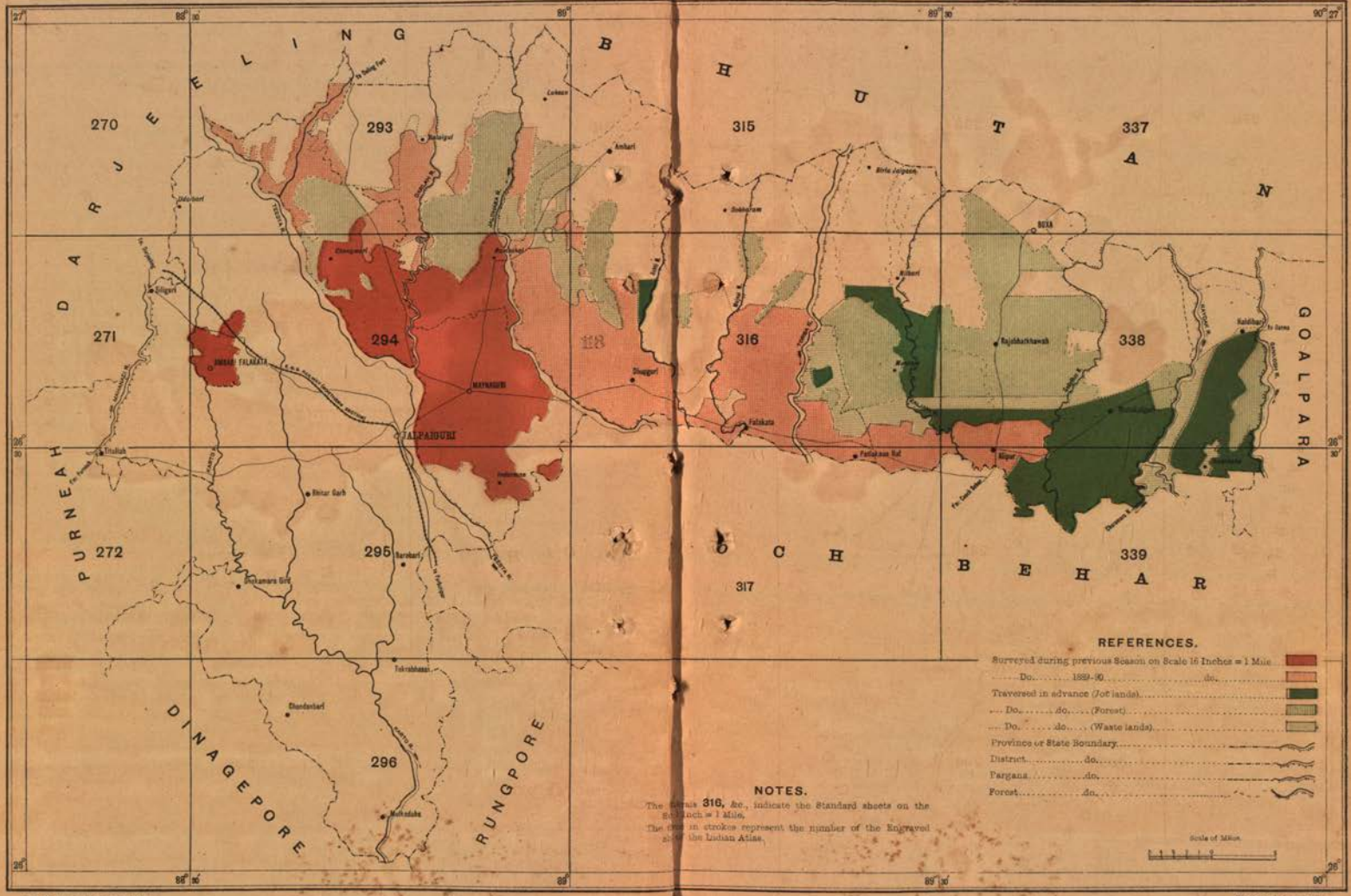
17. The Western Dooars of Julpigoree were obtained by conquest in 1864. Settlements were made from time to time, the last of which will expire in 1891. In the course of an enquiry in 1874, it was found that the maps and records were untrustworthy, and it was decided that at the next settlement a more detailed examination of the facts relating to each holding should be made. It was therefore decided in the cold weather of 1888 to undertake a professional survey, and to prepare a complete record of rights of all classes of tenants. The total area of the Dooars is 1,913 square miles, inclusive of forest, jungle, and waste lands. To the end of last year's field season the traverse survey of 450 miles, and the cadastral survey of 210·35 square miles, had been completed. In the field season of 1889-90 it is reported that 782 square miles had been traversed, the 4-inch topographical survey of 118 square miles, and the cadastral survey of 304 square miles, had been completed at a total cost of Rs. 76,553, and it is estimated by the Survey Department that, in order to complete the records of this area, a further sum will be required, making a total outlay of Rs. 1,04,509, or $9\frac{3}{4}$ annas per acre. This expenditure is far in excess of the estimates prepared by the Survey Department, and is said to be due to the unhealthiness of the climate and to want of co-operation on the part of the people; but it may be noted that, when the estimates were prepared, the survey authorities had had a year's experience of the locality, and it would appear that the difficulties now pointed out might have been foreseen. Moreover, the cost per acre in the year under report was far in excess of that of the previous year, and cannot, therefore, be wholly accounted for by the nature of the climate or by the attitude of the people.

18. *Settlement.*—The settlement work was somewhat delayed, by the deputation of the Settlement Officer, Mr. Walsh, on other duty, which ultimately rendered it necessary for him to take leave owing to illness, and also by delay in the appointment of his successor, at the most critical period of the cold weather, when the rice crop was being cut, and the Settlement Officer should have been ascertaining the value of the produce of the different classes of soil. Reports have recently been submitted to Government, in which proposals have been made for the adoption of certain soil-class rates which are slightly in excess of those adopted at the last settlement. The jotedars, it is reported, are willing to accept the proposed rates, and as soon as sanction of Government to them is received, the settlement of the South Mynagoree tehsil can be concluded. The total cost of settlement operations to the end of 1888-89 was Rs. 3,452, and during the year under report Rs. 21,303. This, however, includes cost of demarcation, of boundary pillars, and Mr. Walsh's salary while on other duty. The increase of revenue expected is about Rs. 40,000.

BENGAL SURVEY.

INDEX TO THE CADASTRAL SURVEY IN THE EASTERN DOOARS (DISTRICT JALPAIGURI).

No. 4 PARTY.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DINAGEPORE
RUNGPORE
GOALPARA
JALPAIGURI
MAYNAGURI
BIRPARA
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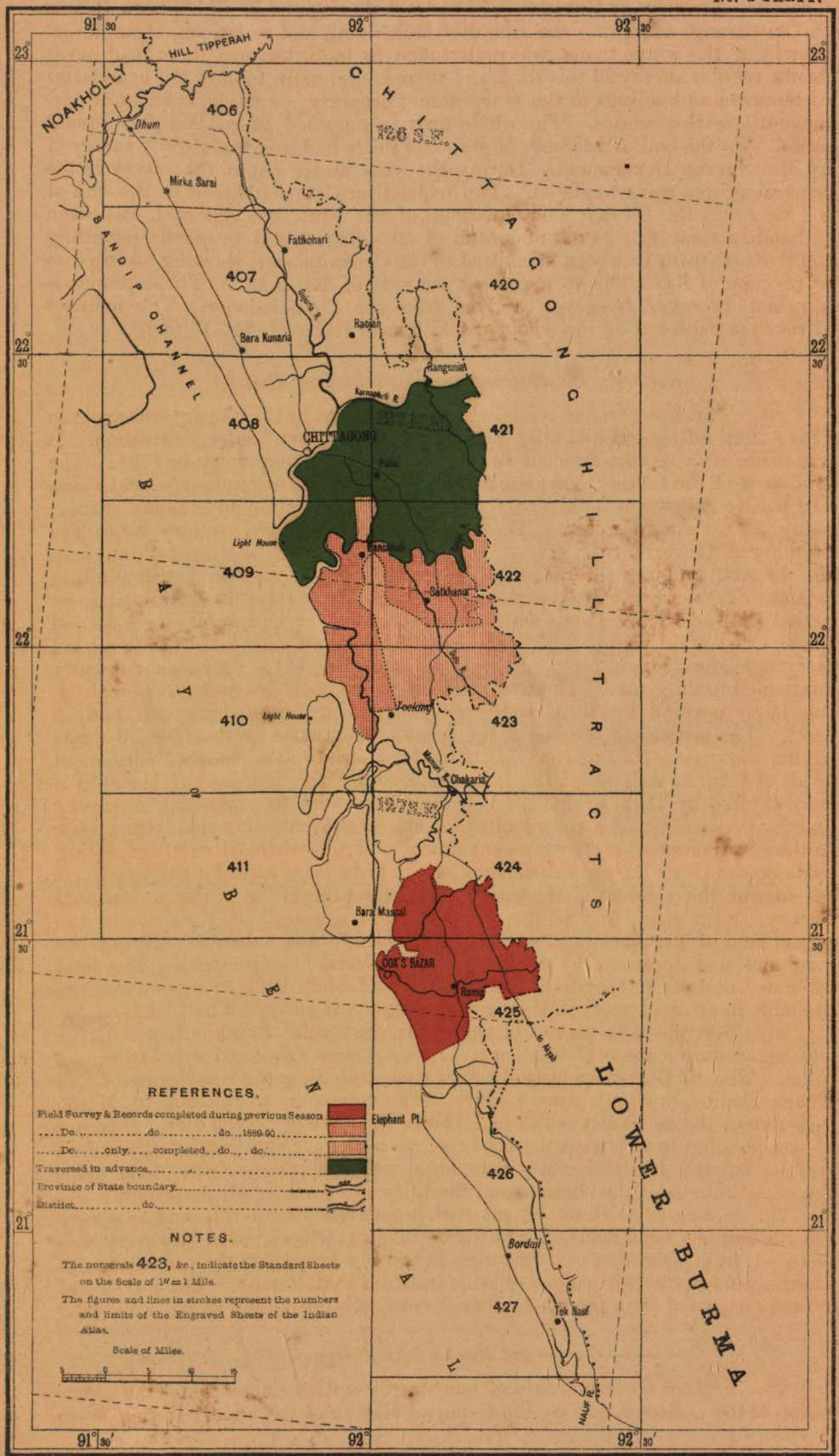
BENGAL SURVEY.

INDEX TO THE CADASTRAL SURVEY IN DISTRICT CHITTAGONG.

No. 2 PARTY.



Reg. No. 245, S. I. D.—16-9-90.—1,050.

Photo., S. I. O., Calcutta.

Old Thana Ramoo in Chittagong.

19. A survey of Government khas mehals situated in Old Thana Ramoo in Chittagong, excepting the island of Moheskhal, and embracing about three-fourths of the whole thana, was undertaken in 1888, because there had never been a regular survey of this tract, and there are no maps to show the boundaries of tenures and holdings in the Government property, or the boundaries of permanently-settled estates. The whole area is supposed to contain 245 square miles. To the end of 1888-89, 50·6 square miles had been cadastrally surveyed by the Survey Department. During the year under report the survey of the remaining area was completed. The expenditure on settlement to the end of the year was Rs. 1,495. The settlement of fair rents, it is reported, was taken in hand in respect of 24 out of a total of 50 villages, and proposals regarding the rents of them had been submitted to the Commissioner, showing an increase of revenue of Rs. 5,349 on a present revenue of Rs. 9,595. These proposals have not, however, been yet received from the Commissioner. The increase of revenue expected on the whole of Old Thana Ramoo is Rs. 15,000.

Re-survey and Settlement of the Chittagong District.

20. The first revenue settlement of the district of Chittagong was made in 1764: that settlement had only reference to lands then under cultivation. It was made after re-measurement and was confirmed in perpetuity in 1793. The total area of the estates then permanently settled and of revenue-free estates was 740 square miles: the total area of the district, according to Siddons' survey, being 2,717 square miles. There thus remained 1,907 square miles the property of Government. These Government lands are scattered throughout the district, and are intermixed with permanently-settled and revenue-free estates. Temporary settlements were made of a portion of them during the period 1833 to 1848. Lands which were cultivated or culturable were settled for a period of 50 years. Those which were covered with jungle were settled on jungleboori leases for terms varying from 5 to 15 years, subsequently 'extended to 25 years.' The term of these jungleboori leases having expired, the lands covered by them were re-settled for a term which will end in 1898. The settlement of some of the talooks which were settled for 50 years during the period 1833 to 1848 has already expired. The term of settlement of all of them as well as of the lands covered by the jungleboori leases, will have expired by 1898, so that it has become necessary to undertake a survey and the preparation of a record of rights and settlement of rents, with a view to the re-adjustment of Government revenue, of the whole district excepting parts of the Cox's Bazaar sub-division, which have been already surveyed. A scheme for the conduct of the survey under the supervision of the professional Survey Department, and of the preparation of a record of right under the supervision of Mr. Slack, C.S., as Settlement Officer, was submitted during the year and was approved by the Local and Imperial Governments. The total estimated cost of the operations is about four-and-a-half lakhs of rupees, and the probable increase of revenue is estimated roughly at one-and-a half lakhs.

21. *Survey.*—The survey of the thanas Satkania, Banskhali, and Patya was begun during the cold weather. The total area traversed was 716 square miles. The total area cadastrally surveyed, including the completion of Old Thana Ramoo, was 270 square miles. The total cost to the end of March inclusive of the area surveyed in Old Thana Ramoo was Rs. 82,490. It is not as yet possible to say what the final cost per acre for completion of the survey will be, but it is feared that it will be high, owing to the smallness of the fields the unhealthiness of the climate, and the litigious character of the people.

22. *Settlement.*—No settlement work proper was done in this area, as survey records had not been made over to the Settlement Officer, who, however, was engaged in demarcation of boundaries, in the supervision of the preparation of khasras, and in the settlement of rents in Old Thana Ramoo. The increase of revenue expected from the whole district is roughly estimated at Rs. 1,50,000.

Government Estates in Backerganj.

23. Sixteen Government and temporarily-settled estates under the supervision of the Collector, and by the Deputy Collector of the Sudder station, were

pending settlement at the close of last year, to which fifteen similar estates were added during the year under report. Very little progress appears to have been made by the Deputy Collector with the settlement of the latter estates, but he was also employed on other duty. A special officer was recently appointed to conduct the settlements and it is hoped that he will be able to bring them to a speedy conclusion.

24. The settlement of 33 churs and petty estates was carried out under the old settlement Regulations, and resulted in an increase in revenue of Rs. 5,655.

25. *Professional survey of Government estates in Backerganj.*—A professional survey of 17 Government estates with a total area of 157 square miles, of which 46 square miles are more or less under cultivation and the remainder under jungle, was ordered during the year. The survey was completed, but a considerable portion of writing up of the records remained to be done at the end of the year. One and the same party was employed on the survey of these, and of the Dakhin Shahbazpore Ward's Estate, the expenditure on both Government and Wards' Estates was Rs. 23,374, but it is not stated how much of this is chargeable to the Wards' and Government Estates separately. The increase in Government revenue expected is Rs. 7,000.

Government Estates in Midnapore.

26. *Bhetia.*—This estate consists of 23 villages with an area of 6,785 acres. The last settlement expired in 1882, and settlement proceedings were then begun, but on account of difficulties in carrying them on, under the law as it then stood, they were kept in abeyance pending the passing of the Tenancy Act. They were resumed in 1887, but owing to frequent transfers of settlement officers, the completion of the settlement was delayed. The work has now been brought to a close. The rent-roll has been raised in the aggregate from all sources from Rs. 1,671 to Rs. 2,869. The tenantry have all voluntarily agreed to the increase, with the exception of one raiyat, who refused to sign the khatian on the ground that his rents had been fixed in perpetuity. His appeal to the Special Judge against the decision of the Settlement Officer is now pending. The cost of settlement including survey to end of March last was Rs. 3,236-6-11 on about 6,789 acres, or annas $7\frac{2}{3}$ per acre. The survey cost Rs. 1,925, and settlement Rs. 1,311-6-11.

27. *Kaminachuck.*—This is a petty Government estate of 739 acres, the settlement of which was begun in 1887 under the supervision of the Sub-divisional Officer of Tumlook. Owing to frequent transfers of officers, the settlement is not yet completed. During the year some intricate disputes regarding claims to lakhiraj lands were decided. The delay in completing this settlement is very discreditable to the Sub-divisional Officers concerned, whose attention has been frequently called to the matter.

SMALLER GOVERNMENT ESTATES.

Government Estates in Nuddea.

28. *Bahir Chur Dhobrakoli* is an island formation in Nuddea, which was resumed under Regulation II of 1819 in 1827. The estate has undergone five settlements, the last of which expired in March 1887. In June 1888 an order was passed directing that a survey be made and a record of rights prepared under the Bengal Tenancy Act. Measurements were completed and tested during the year. The settlement officer passed an order declaring Babu Bedhu Bhusan Mitra, a jotedar, to be entitled to settlement. Against this order the raiyats appealed. The settlement officer's decision was upheld. The revenue payable to Government was fixed by the settlement officer at Rs. 3,991, but this amount was reduced on appeal by the Judge to Rs. 3,110.

29. *Chur Hanspookaria* is an alluvial accretion notified for survey and settlement. The survey was completed and the measurements were tested, but when the settlement officer was about to settle fair rents he was transferred.

Government Estates in Noakhally.

30. *Chur Peer Buksh.*—This estate contains an area of 5,088 acres, and was notified for survey under the Bengal Tenancy Act in November 1889. The

measurement was commenced in January 1890, and completed during the year at a cost of Rs 478, or 1½ anna per acre. The lowness of cost is due to the fact that the district staff was employed and not charged for. It was originally proposed to enhance the rates of rents, but after much correspondence it was decided that there were no legal grounds for such enhancement. Proceedings were therefore instituted to assess the excess lands at existing rates and to prepare a record of rights. An increase of about Rs. 300 is expected by the Collector from assessment of excess lands.

Government Estates in Tipperah.

31. *Pergunnah Singergaon, hissa* 4 *annas.*—The last settlement of this estate expired in 1872, and various attempts, which ended in nothing, were made to re-settle it since that time. A survey and settlement were therefore ordered under Chapter X of the Tenancy Act. The measurement was completed at the clos of last year.

32. Prices have more than doubled since the rents were last fixed. The existing rents were enhanced, on this ground, by 2 annas 9 pies in the rupee in respect of arable lands, while the rents for bhiti or homestead lands were calculated according to the existing rates. The present assessment shows a rental of Rs. 7,239 8-7 against Rs. 4,791, the previous rental. The increase is partly due to an increase in rates, but mainly to excess area.

33. The cost of survey was Rs. 2,554, or annas 10-10 per acre on an area of 3,757 acres.

34. The settlement cost Rs. 587, or 2½ annas per acre, the total cost for both works being Rs. 3,141, or annas 13⅓ per acre. There were many difficult and intricate questions in dispute, all of which have been disposed of.

35. *Juar Baluakandi.*—The last settlement of this estate expired in 1874, and various measurements have since been made which were subsequently cancelled. A fresh measurement and a record of rights were ordered to be undertaken under the Tenancy Act.

36. The measurement was completed during the year 1888-89. The rental of the estate according to present settlement is reported to be Rs. 3,407-12-4 as against the previous jummah of Rs. 2,021. The final khatians were published during the year under report. The expenditure was Rs. 1,447.

Government Estates in Dacca.

37. The only Government estate under survey and settlement during the year was Joar Jaymangal. The estate is one in which certain talukdars have a right to settlement. The last settlement was made in 1875. It was cancelled in 1886, as the settlement-holders failed to pay in the Government revenue. The estate has since been held khas. The survey was completed during the year. No progress was made in the settlement.

Government Estate Dhanchuhan in Shahabad.

38. This estate was settled with one Bhownath Roy from 1874 to 1892. He defaulted in payment of the Government revenue, and the estate was therefore taken under direct management. It was found that while in possession, the late settlement-holder had forcibly dispossessed many raiyats of the estate of portions of their holdings that he kept some of their lands in his own cultivation and settled the remainder with his relatives at lower rates than were paid by the original tenants. He further retained some lands in his possession without payment of any rent to Government. For these reasons it was deemed desirable to make a survey and record of rights.

39. The property consists of ten small estates, of which the settlement of seven was completed with the result of an increase of revenue from Rs. 1,426 to Rs. 1,739, or nearly 22 per cent. The raiyats are reported to have accepted the enhancement without objection.

General remarks on expenditure on surveys and settlements of Government Estates.

40. The total expenditure during the year chargeable to the Government of Bengal on professional surveys of Government and temporarily-settled estates, was, so far as can be ascertained from the Survey Department

Rs. 1,83,285 exclusive of cost of traversing debitable to the Government of India, and on non-professional surveys and on settlements Rs. 1,18,417. Though the expenditure on professional surveys (over which this Department has no control) in some cases exceeded the estimates, yet as the expenditure on settlement work was less than the estimates, the total outlay on surveys and settlements chargeable to the Government of Bengal is less than the provincial allotment.

41. The total increase of revenue actually obtained in Government estates the settlement of which has been completed, or is approaching completion, is about Rs. 54,000, inclusive of the increase in revenue in Angul, of which the jamabandies have for the most part been completed and only await confirmation.

42. The estimated expenditure on all surveys and settlements of Government and temporarily-settled estates, which have been already sanctioned, is about Rs. 26,00,000, the estimated increase of revenue when the operations are completed being about ten lakhs of rupees.

WARDS' ESTATES.

Srinagar-Baneli estates.

43. These estates have been eight years under the management of the Court of Wards. The rent-roll was in such a state of confusion that it was found impossible to establish order without a survey and record of rights, which were applied for by the proprietors and ordered to be undertaken in the cold weather of 1887 under section 101 (2) (*a*) of the Tenancy Act. About 30 square miles, consisting chiefly of scattered portions of estates, remained to be surveyed at the close of last year.

The survey was completed and all the records were made over to the Settlement Officer by the middle of November 1889. The area is now reported to be 695 square miles, subject to alteration on the decision of some pending boundary disputes. Of the total area, 81¼ square miles were surveyed by the Settlement Department at a cost of Rs. 11,800, and the remainder by the Survey Department at a cost of Rs. 1,21,700. The total cost of survey, including that of traverse survey, has been a little over 4¾ annas per acre. The cost in Purneah and Maldah was heavier than elsewhere owing to the scattered nature of the estate lands in these districts, the small size of the plots, and the higher cost of field labour.

Settlement.

The progress made in settlement work during the year was as follows.

44. *Bhagalpur, Daphar pargana.*—In this pargana 77 villages were surveyed with an area of about 88 square miles, but some villages which had been diluviated by the Kosi were left unsurveyed. Of the 77 villages, the settlement was completed in 68 before the commencement of the year. A dispute arose as to the levy of a cess called *bhatta*. The Judge in appeal decided it to be legal, but a difficulty in procedure arose in carrying out the Judge's order, and eventually the matter was amicably settled by the raiyats consenting to pay half the cess. The records of these 68 villages have accordingly been completed and sent to the Collectorate record-room. The result of the settlement in them shows an increase of rental from Rs. 41,289 to Rs. 47,637, or 15 per cent., due to an increase in the area of holdings. The remaining 9 villages in this pargana lie to the east of the Kosi river. Of these the settlement of 8 was completed, and merely await final publication of the records, and one was pending at the end of the year for disposal of objections.

In the Nowhatta circle there are 125 villages, situated in four parganas. The attestation and disposal of objections in all but one of these villages has been completed: the remaining village is under completion. The records of 68 villages had been finally published at the close of the year. The increase of rental on account of increase in area is about 10 per cent.

45. *Monghyr, Turkhya pargana.*—There are 134 villages in this pargana. Attestation had been completed in most of them during the previous year, and the disposal of objections and completion of records was carried out during the year under report. The records of 108 villages had been finally published, and the remainder were ready for final publication. The increase of rental is about 7 per cent.

46. *Purneah.*—The area of the estates in this district is about 200 square miles. The settlement began in March 1889 with the following results:—

Of the 69 villages in parganas Haveli, Kudwa, Dhurrumpore, and Shahpur, 51 had been completed and objections were pending in 18. The draft publication had been completed in all. The results show very slight alteration of rentals, as it is reported no grounds existed for enhancement or alteration. In Tirakhurda pargana there are 26 villages. The settlement and publication of the draft records were completed during the year, but objections remained to be disposed of in 20 villages. The increase of rental on account of alteration of area is about 6 per cent. In Soojanagar pargana there are 60 villages the settlement of which had been completed and the draft records published. Objections, however, remained to be disposed of in 31 villages. The increase in rental is very slight. In parganas Tajpur and Dehat there are 35 villages of which the draft records had been published. The existing rents were recorded.

47. *Maldah.*—The Maldah district contains 71 villages appertaining to the Srinagar-Baneli estates in the Mahinagar pargana and 66 portions of villages in the south of the district. The attestation of rentals was completed in most of the villages in Mahinagar before the close of the year, but some settlement suits were pending in 12 villages. The total number of raiyats whose rents were recorded, status determined, and for whom fair rents were settled, is 70,749.

48. *Increase of rental.*—The rents settled in the entire estate, exclusive of rents of raiyats whose rentals were merely recorded, amount to Rs. 3,87,167, against Rs. 3,65,325 shown in the landlords' papers, thus giving an increase of Rs. 21,842, or 9 per cent. on the total outlay, and a larger percentage on the share of expenditure charged to the proprietors.

49. *Cost.*—The expenditure up to the end of March on settlement work was Rs. 96,500. The Settlement Officer hopes to complete the work with an additional expenditure of Rs. 16,000, making a total of Rs. 1,12,500 for settlement. The total cost of survey and settlement will thus amount to Rs. 2,46,000, or annas $8\frac{5}{6}$ per acre—

	Rs.	
Survey ...	... 1,33,500	
Settlement ...	... 1,12,500	
Total	... 2,46,000,	against an estimate of Rs. 2,50,000.

The Settlement Officer hopes to complete the work by the end of September. Mr. Collin with a staff of four Assistant Settlement Officers was in charge of the operations. The cost, considering that the estates were scattered, is not excessive, and the results should, at least from the landlord's point of view, be regarded as satisfactory, while the raiyats, though their rents have been slightly enhanced, will at least have the advantage of being placed beyond the reach of harassment and fraudulent jamabandies for a period of 15 years.

50. *Apportionment of costs.*—Orders were passed, near the end of the year, apportioning the costs between the landlords and raiyats under section 114 of the Tenancy Act. It has been decided that the raiyats shall pay 2 annas per acre on the areas of their holdings, and that the balance shall be paid by the proprietors in proportion to their several interests.

Burdwan Raj Khas Mehals.

51. The survey of the khas mehals of the Burdwan Raj in the districts of Midnapore, Bankoora, Burdwan, Hooghly, and Nuddea was ordered to be undertaken in January 1889, because the existing rent-rolls were reported to be in confusion. The total area which was supposed by the managing authorities to be comprised in these mehals was 152 square miles.

52. *Survey.*—From commencement of the field season to end of April 1890 theodolite observations had been made at 7,790 stations, and 1,562 linear miles had been measured in the course of the traverse operations. All theodolite stations were marked by *gharras* and charcoal, except 568, which were marked by stones, either triangular or square-topped. The detail survey was made on

the scale of 16 inches to the mile, and was conducted on the method followed by all cadastral parties of the Survey of India Department, modified so as to suit local conditions.

53. Up to end of April 229·15 square miles had been surveyed, field by field, on the scale of 16 inches to the mile, leaving a balance of 26 square miles still to be surveyed. It thus appears that the actual area of these estates is far in excess of what was supposed. The records had been completed of 268 villages, containing 159,951 khasra entries.

54. There was very little trouble experienced when the operations first began in the tract which had been traversed the previous season. In a few instances the villagers had to be warned. But when traversing and cadastral work began in villages the ownership of which is disputed, some opposition was offered.

55. The cost of operations, to the end of April 1890, was Rs. 76,345, By the time the work is complete and the records are made over to the Settlement Officer, the cost is expected by the Survey Department to be about annas $5\frac{1}{2}$ an acre. This may be considered satisfactory for professional work of such scattered areas in Bengal.

56. *Discovery of villages wrongly appropriated by others.*—In the course of the survey operations it came to light that a large number of mouzahs belonging, it is alleged, to the Burdwan Raj estates, which had never been let in patni or otherwise alienated, had been taken possession of by others. Towji No. 4 of the Bankoora district contains, according to the Collectorate records, 349 mouzahs, and was purchased by the Raj, at a sale for arrears of revenue, about the year 1828. Of these 349 mouzahs, 3 were given in putni by the Raj within a year or two after the purchase, leaving 346 mouzahs apparently khas. In 1855 thakbust maps were prepared, and in these thak maps and records, a number of persons had their names registered as proprietors of 161 mouzahs, appertaining to towji No. 4, without opposition on the part of the Raj, thus leaving 185 mouzahs still to be accounted for. Of these, 90 have been traversed as undisputed khas mouzahs, leaving 95 mouzahs of which nothing was known except their names. They were not shown in the Raj books, but from enquiries made on the spot by the Survey Officer, Mr. Scott, it was ascertained that they were in possession of one Beni Madhub Banerjee of Bankoora, who, it was found, had neither registered his name as proprietor nor filed road cess papers for them. In order to ascertain where they are situated, and to enable the Raj to adopt measures for resuming khas possession of them, a traverse and boundary survey of all lands appertaining to towji No. 4 was ordered under the Survey Act, V of 1875.

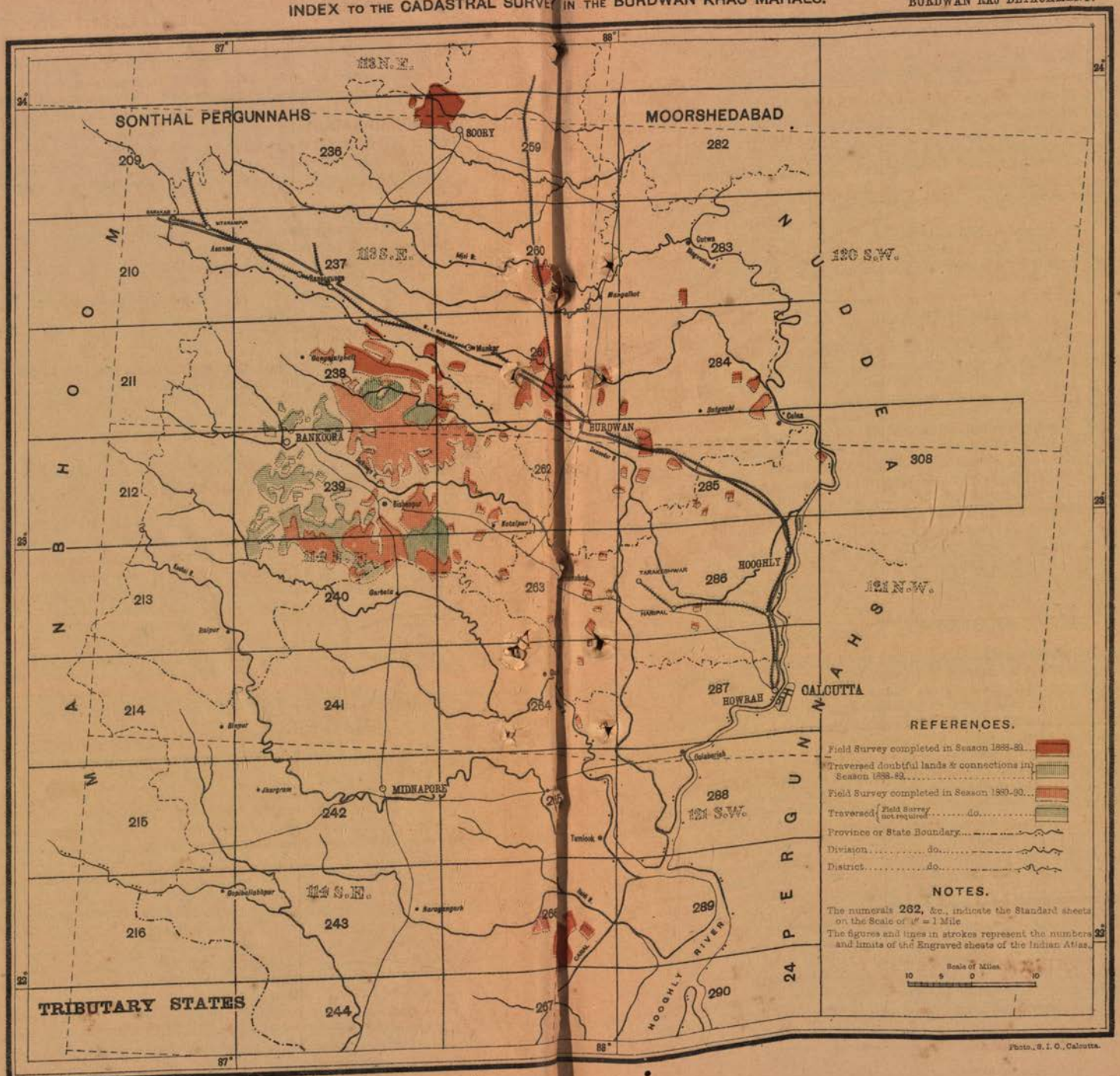
Similar confusion is said to prevail in towjis Nos. 1 and 3 of the Bankoora district, and the fact is significant, as illustrating the chaotic state of the records kept, in Bengal, in zemindari offices supposed to be well managed. Mr. Reily has resumed khas possession of many of these mouzahs without opposition, and the persons in possession of others have applied to him to come to terms with them, as to the settlement of them.

57. *Settlement.*—Two Settlement Officers have been appointed—one, Mr. D. L. Roy, for the settlement of rents of the Raj estates in pargana Soojamutha in Midnapore; the other, Babu Sukumar Haldar, for settlement of rents in the Bankoora estates. The Manager, Mr. Reily, was instructed to endeavour by amicable arrangements with the raiyats to determine what would be fair rents, acceptable to the raiyats and to the managing authorities, so that, if the parties came to an amicable agreement amongst themselves, the duty of the Settlement Officer would have been confined to the determination of the status of the different classes of tenants and to recording the rents agreed to by the parties. Mr. Reily accordingly made certain proposals which he considered fair, and they were accepted by the Board. They were not, however, accepted by the raiyats in Soojamutha, and the Settlement Officer having given the parties time to come to an arrangement among themselves, was ultimately obliged to proceed to settle fair rents according to law. In the first case decided, which was held to be a test case, he reduced what were alleged to be the existing rates by nearly 50 per cent. under section 38 of the Tenancy Act, on the ground that the soil had become permanently deteriorated owing to the silting up of the drainage khals and of Kalinagar river, and consequent submersion of the lands for want of an outlet for the

BENGAL SURVEY.

INDEX TO THE CADASTRAL SURVEY IN THE BURDWAN KHAS MAHALS.

BURDWAN RAJ DETACHMENT.



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drainage. The Manager has appealed against this decision to the Special Judge, who has fixed the 30th August for hearing the appeal.

58. In Hukumapore the raiyats are reported to have accepted the Manager's rates, but they claim as rent-free, certain lands which the Manager alleges to be rent-paying.

Kanika Ward's Estate.

59. This estate was brought under survey under Act V of 1875, because the existing zemindari measurement papers are incomplete and inaccurate, and the present settlement will expire in 1890. The total area of the estate was estimated at 450 square miles, of which the traverse survey of 261 square miles was completed last year. During the year under report traversing of the remainder of the estate and the cadastral survey of the entire estate was finished at a cost to the end of May of Rs. 32,652 for survey and Rs. 1,685 for settlement, or 4½ annas per acre.

60. *Settlement.*—The Manager submitted proposals for the settlement of the estate on which the Board passed orders. Mr. Dutt, a Cirencester graduate, who has recently been appointed as Settlement Officer, is now engaged in carrying out these orders.

Kujong Ward's Estate.

61. It was necessary to undertake a survey of this estate, which forms a part of the property of the Burdwan Raj, because the term of the previous settlement had expired. The total area was estimated at 368 square miles. By the end of last year 69,120 acres had been cadastrally surveyed by a professional party. During the year under report the survey was completed. The cost to the end of the year was Rs. 48,582 or 3½ annas per acre.

62. *Settlement.*—Mr. Reily, one of the Managers, submitted in February, proposals for an amicable settlement of rent, which, with some modifications, were accepted by the Board in March last, but could not be carried out within the year. The survey records of 420 mouzahs were received by the Settlement Officer. The entries in 369 were explained to the raiyats and their signatures obtained. The raiyats of 51 mouzahs refused to attend at the time of attestation and to sign the khatians. The Settlement Officer, Babu Chandra Nath Ghose, reported that the raiyats were willing to accept the terms proposed by Mr. Reily, but he has up to date, concluded the settlement of only one village, on these terms.

Sunkerpore.

63. The survey of these estates, which are owned by a minor under the Court of Wards and three co-sharers, was completed during the year by the Survey Department. The total area according to survey is 329 square miles.

Survey.

64. The settlement of the estate was made by amicable compromise between the landlords and tenants. In pergunnah Santosh an allowance of 20 per cent. was made for "close measurement," on the area shown in the zemindari papers, that is to say, for differences resulting from the scientific system of survey, compared with measurement by the old method by throwing a pole. Only the excess area over and above this 20 per cent. was assessed at existing rates. In the other pergunnahs 25 per cent. was allowed. In cases where the excess area could not be ascertained from the landlords' papers, the rent of the Ward's share was increased under section 29 (*b*) of the Tenancy Act to the amount which the tenants were actually paying to other co-sharers. Fair rents had been settled by the end of the year under report for 28,596 tenants.

Settlement.

65. The assessment has resulted in an enhancement of Rs. 15,588 on the previous rental of Rs. 86,308, or 18·06 per cent. on the previous rental, and nearly 12 per cent. on the cost of the operations. This increase is partly due to excess area found in the tenants' possession by the present survey, and partly to the assessment of new holdings. The rates have not been increased; and where the new area did not exceed the old by more than 20 per cent., no enhancement was claimed for excess area.

66. Two survey schools were opened—one at Balloghat and the other at Mohadeopore—at the cost of the estate to train up a body of local men for the maintenance of records. The estate amlahs have, it is reported, now acquired a fair knowledge of practical surveying.

67. The total cost of survey and settlement was Rs. 1,25,902 to the end of March, that is, Rs. 89,611 for survey and Rs. 36,291 for settlement. The total cost of the proceedings to the end of the present month, when they will be brought to a close, is estimated at Rs. 1,32,000, or nearly 10 annas per acre. The cost is high owing to the scattered character of the estates, and was unnecessarily increased by the operation of some mistaken orders issued by the Officiating Collector. An order was issued by Government under section 114 for apportionment of costs on the following principle:—

(1) That the raiyats and rent-free tenure-holders pay half the actual cost of cadastral survey and record of rights of their respective holdings and tenures.

(2) That the landlords pay the other half.

(3) That the entire cost of boundary and traverse survey, and of the survey and record of rights of waste and unoccupied lands, be borne by the landlords.

In apportioning their respective shares of the expenses among the landlords themselves the following distribution has been ordered :—

(*a*) When the proprietors have not let their shares in patni, they are to pay in proportion to their several proprietary interests.

(*b*) When they have let their shares in patni, the proprietors are to pay one-third of the landlords' share of expenses for the land let in patni and the patnidar's two-thirds.

The Collector reports that a sum of Rs. 19,600 has been realised from the co-sharer landlords.

Chooramon.

68. Most of the work of this estate had been completed before the commencement of the year under report. In April 1889 draft records were published in all villages, and by the end of June all petitions of objection had been disposed of and the records finally published in all but seven villages, in which Maharanee Surnomoyee was found to be in possession of an interest not registered in the general register of the Collectorate. By the 14th July the ward's copy of the records, as well as the tenants' copy, had been generally distributed, the greater portion of the settlement establishment was discharged, and the records were made over to the Collectorate.

69. The average size of a holding is 4·09 acres, but the average area held by each individual raiyat is larger, being about 7·17 acres. The average area of a settled raiyat's holding is about 4·67 acres, that of a non-occupancy raiyat about 2·64 acres; but the average areas held by individual, settled and non-occupancy, raiyats are about 8 and 3 acres respectively.

70. The cultivated area is 57·2 per cent., the culturable area is 28·9 per cent., and the unculturable area is 13·9 per cent., of the total area. The area under grass is about 4·1 per cent.

71. The total cropped area is 88·6 per cent. of the total cultivated area.

72. The total cost of the survey was Rs. 20,206, or annas $5\frac{5}{6}$ per acre, and of the settlement Rs. 13,397, or annas $3\frac{5}{6}$ per acre.

73. A survey class was opened when 24 local men qualified. Out of these three have been employed for maintaining the records by the ward, who has now attained his majority.

74. The operations were conducted without any friction or difficulty. The raiyats generally showed eagerness to attend at the attestation of the records, and it is reported took much interest in having their fields and rents correctly recorded. The previous rental remains unaltered. It was thought that it would not be to the interest of the proprietor to have a settlement fair rents made by which he would be debarred from obtaining any further enhancement for fifteen years. Existing rents only, were on this account, recorded, and no application for settlement of fair rents was made.

75. An order for apportionment of costs was passed under section 114, following the principle described under Sunkerpore.

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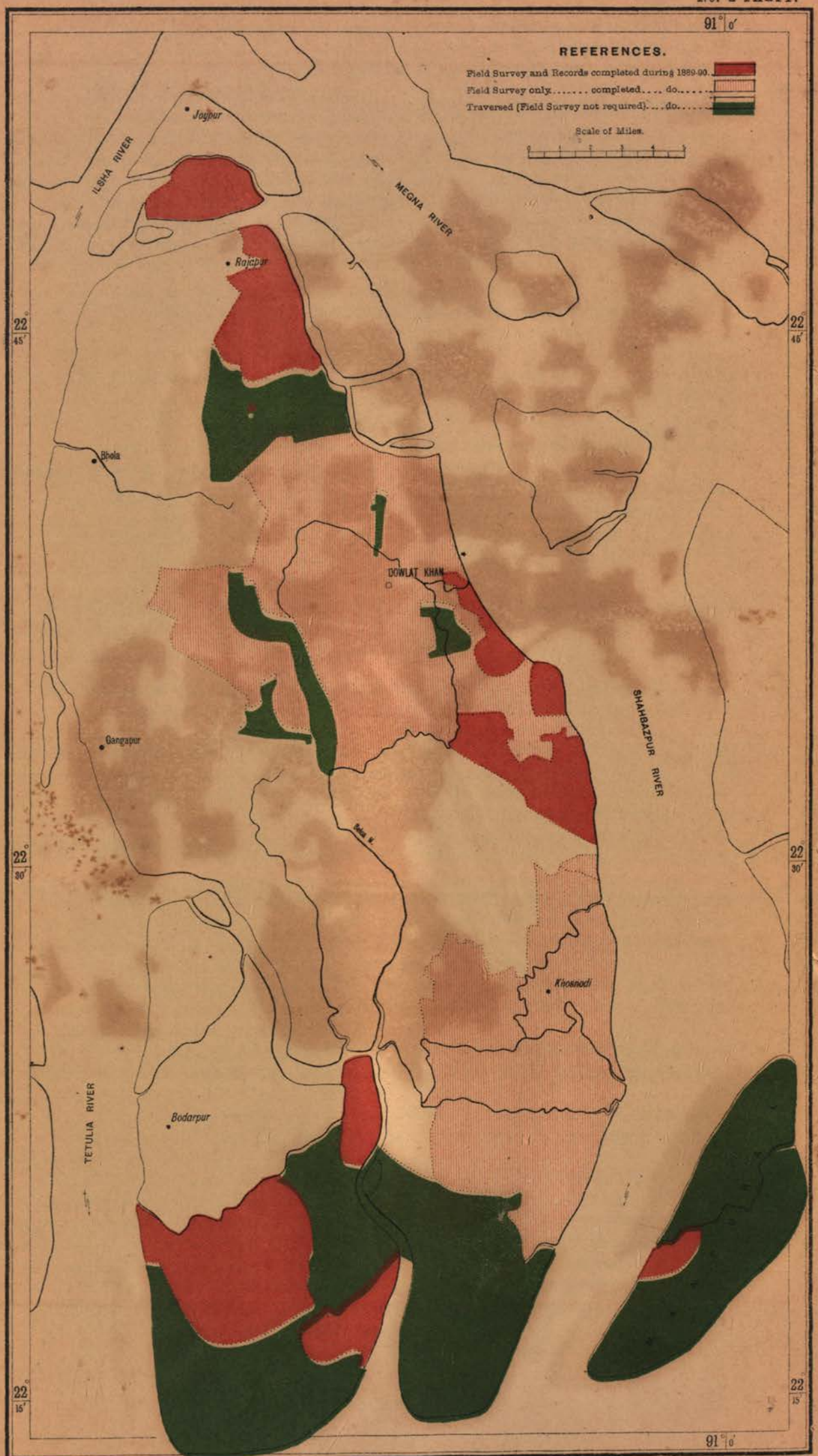

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BENGAL SURVEY.

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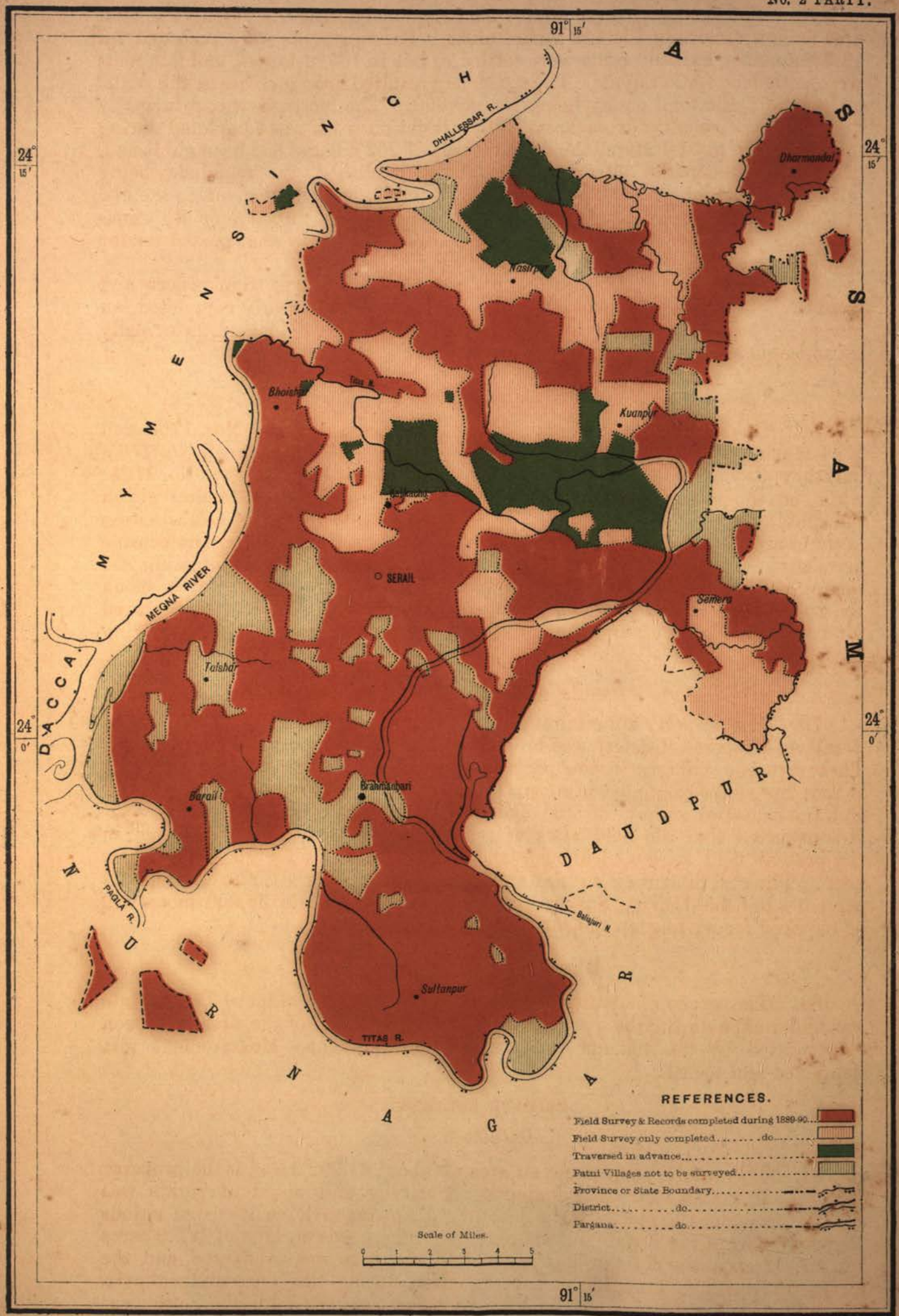

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Maldwar.

76. The survey of these estates was completed during the year. The total area as now ascertained is 152 square miles. Existing rents were recorded for 18,220 tenants, existing rents were settled as fair in 105 instances, and fair rents were settled for 4,625 raiyats. The settlement resulted in an increase in the rental of Rs. 4,508, the total outlay being Rs. 59,390. The increase was principally due to the assessment of excess area. The attestation work was completed during the year. Up to 31st March the draft records of 262 villages had been published, of which the records of 92 again were finally published, the remainder being left for the current year. The total cost of Survey and Settlement to the end of June when the operations were completed was Rs. 59,390, or 9½ annas per acre. An order for apportionment of costs, similar to that passed for the Sunkerpore estate, was issued during the year.

77. In the three important wards' estates of Srinagar, Sunkerpore and Maldwar, of which settlement of rents is completed, or nearly completed, an increase of rental amounting to Rs. 41,938 per annum was obtained, principally by amicable arrangements and with the consent of the raiyats.

Dakhin Shabazpore Ward's Estate.

78. Dakhin Shabazpore pargana consists of two estates, Nos. 1763 and 1764 of the Collector's towji. The wards are sole proprietors of towji No. 1763, but they also hold tenures within the external boundaries of towji No. 1764; while, on the other hand, the owners of towji No. 1764 held tenures within the ambit of towji No. 1763. In order to ascertain the extent and situation of the wards' lands in both estates, a survey of the entire pargana became necessary. The traverse and cadastral survey of the pargana, comprising 259 square miles, was completed, the expenditure to the end of March being Rs. 23,374, in addition to which a further sum of Rs. 20,877 will be required for completion of the survey records. No settlement work was done during the year.

Serail Pargana Ward's Estate.

79. The property appertaining to the Cossimbazar ward's estate in pargana Serail, in Tipperah district, was brought under survey by a professional party. There are 335 villages in the pargana, of which 37, being held by patnidars or rent-free, were exempted from survey. The traverse survey of 293 villages and the cadastral survey of 155 had been completed by the end of the year. It is expected that the field work of 259 square miles will be completed in the present field season, leaving about 20 square miles for completion next year. The cost of survey to the end of March was Rs. 31,509, or annas 3⅔ per acre, but the Deputy Surveyor-General reports that Rs. 30,000 more will be required for writing up the survey records.

Ward's Estate in Khoolna.

80. The survey of a patni tenure appertaining to the Saidpore Trust estate was undertaken during the year on the ground that part of the area had been appropriated by the tenants without payment of rent. Measurement was completed and tested.

PRIVATE ESTATES.

Dubulhatti.

81. This estate, comprising an area of about 41,992 acres, is the property of Rajah Haranath Roy of Dubulhatti. A survey and record of rights was undertaken under Chapter X of the Tenancy Act owing to the existence of serious disputes between the Rajah and his tenants. There was an area of 1,720 acres left for survey at the close of March 1889. This area was completed and the survey proceedings brought to a termination during the year under report. An amicable compromise on the basis of terms suggested by the Settlement Officer and myself was agreed to by the parties, but there has been difficulty and delay in working out the details. The Settlement Officer reports that the Rajah's zemindari papers were in such a state of disorder that it has been

extremely difficult to ascertain facts. The *jama-wasil-baki* papers, with some exceptions, show the rent of each holding in the village separately, but the raiyats alleged that they made lump payments, though the lands comprised in their respective holdings lay scattered in two or more villages, and stated that the Rajah's *gomastas* or collecting agents granted them rent receipts accordingly. In ascertaining the existing rent with a view to the settlement of fair rents, it came to light that, while a raiyat cultivated no land in a village, a certain amount of rent was entered against his name in the *jama-wasil-baki* papers of that village; and on the other hand, while a raiyat did cultivate a certain area in a particular village, his name did not appear in the *jama-wasil-baki* of that village. The Settlement Officer has in numerous instances found that raiyats cultivating land in one village have got their rents entered in another, and the confusion was made the greater by the absence of any record of mutation of holdings, subdivisions of tenancy, or distribution of rent in the Rajah's *sherista*. The result is that in many villages neither the names of raiyats nor the amount of their rents, as entered in the zemindari papers, correspond with the entries in the khatians. The road cess papers of 1880, which it was agreed should be the basis for ascertaining the existing rents, were prepared from these zemindari papers, and consequently are incorrect. It has therefore been a work of time and much labour to ascertain the correct rent payable by each raiyat. The difficulty was further enhanced by an attempt made by the Rajah to resume a large area of rent-free *brahmottar* and *aima* lands, which gave rise to numerous disputes both before and after the publication of draft records under section 105 of the Bengal Tenancy Act. The compromise, however, greatly tended to restore good feeling, and the Rajah's claim to *chakran* and *pirpal* land was freely admitted by the tenants in by far the greater number of instances.

82. The total number of tenants on these estates is 20,408, of whom 10,261 are holders of rent-free land and the remainder are rent-paying tenants. Up to the end of June the Settlement Officer had published the draft records of all villages. Fair rents had been settled for 5,229 raiyats, with the result of an increase of 25 per cent. on the previous rental as shown in the Rajah's papers. On the other hand, some illegal cesses claimed by the Rajah were struck off. The Settlement Officer says his final report will be submitted in August, and that the total cost of the operations will be Rs. 25,817 or annas 9-9 per acre.

83. Orders have been passed under section 114 apportioning the cost of operations for lands occupied by raiyats in equal parts between them and the proprietor. The Settlement Officer is realising the raiyats' share from them at the time of distributing their khatians. A sum of Rs. 5,243 has been already realised, and the balance, it is said, will be paid as soon as the jute crop is harvested.

Mollarpore Estate in Beerbhoom.

84. The undertaking of a survey and the preparation of a record of rights were sanctioned under section 101 (2) (*b*) of the Tenancy Act, owing to a dispute between the landlord, Mohunt Gopal Dass, and his tenants regarding the rates of rent and other matters, which the Magistrate reported was likely to lead to a breach of the peace. The zemindar claims additional rent for excess area, and desires that the rates of rent payable for the several description of lands may be ascertained, and the excess land assessed at those rates. The tenants dispute the rates and standard of measurement claimed by the landlord.

85. According to present information the area of the estate, which consists of 88 villages, is about 23,320 acres, but it is likely to be more. The cost of the proceedings has been estimated at 8 annas an acre. A party of ten ameens commenced the work on 12th December 1889 under the direction of Munshi Nundji, the Settlement Officer. An area of 10,550 acres was cadastrally surveyed at a cost of Rs. 2,469, or annas $3\frac{3}{4}$ an acre. There was no settlement work done during the year.

Private Estates in Tipperah.

86. *Alakdia Durgapore.*—This is a private estate belonging to the Maharajah of Hill Tipperah, containing an area of 1,264 acres with 415 raiyats, and

was notified for survey and settlement on the 9th February 1888, in consequence of disputes existing between the proprietor and the tenants. Baboo Kali Sunker Sen, a Deputy Collector of the district staff, was appointed to be Settlement Officer. The measurements were completed and tested, but very little progress was made in the settlement work during the year under report. because, it is said, of the reduction of the district staff, the removal of Baboo Kali Sunker Sen to other work, and delay in the arrival of his successor. Instructions have been issued to the present Settlement Deputy Collector to conclude this work as soon as possible. The total expenditure on the proceedings to the end of April was Rs. 857.

Private Estates in Nuddea.

87. Messrs. J. F. Sherrif, who are darpatnidars, applied, under section 103 of the Bengal Tenancy Act, for a survey and record of rights of estates Mritikerpara and others. Their application was granted, measurement was completed, and the settlement papers are now being prepared.

Private Estates in Midnapore.

The following private estates were under settlement during the year :—

1. Kesiari.
2. Bachua, &c., in Bogree.
3. Kharikasuli, &c., in Bogree.
4. Gur Purusattampore.
5. Purbapitpore.
6. Kodalia.
7. Kripanandapore.
8. Gur Moyna.
9. Dakhin Moyna.
10. Rajnagore.

88. Of the above estates Nos. 1, 2, 4, 5 and 10 were pending from the previous year 1888-89, the others were taken in hand during the year under report, and were at first in charge of Deputy Collector, Babu Bisessur Banerjee. In April 1889 Mr. E. Geake commenced the measurement of estates Gur Purusattampore, Purbapitpur and Kodalia, when he was transferred, and the work devolved on the present Settlement Officer, Babu Rajendro Nath Roy, in June 1889.

89. *Kesiari.*—The work on this estate, the survey of which was taken in hand on the application of the landlords, because of disputes with the tenants, was in consequence of irregularities in the procedure of the Settlement Officer held in abeyance, pending receipt of orders on proposals to set aside the proceedings and do the work *de nevo*. In February 1890 these orders were, after lengthened correspondence, received and communicated to the Settlement Officer, and the 22nd April following was fixed for the recording of rights and settlement of rents.

90 *Bachua, &c., in Bogree.*—There are four villages in this estate, namely, Bachua, Sandipur, Katrabali and Hatikhamar, containing an area of 593½ acres. The settlement proceedings were undertaken on the application of the landlord owing to disputes existing between him and his raiyats, and were concluded, and the final report was submitted in February last. There are on this estate 233 resident or settled raiyats, 137 non-resident and 164 panchaki or raiyats holding at fixed rents, besides 256 under raiyats. An increase of 16½ per cent. has been obtained in the previous rental, the rental as settled being Rs. 2,739-10-9 as against a previous *jama* of Rs. 2,351-7-9. The increase is due to the rejection of certain invalid claims to panchaki lands held in excess of the grants, and to the assessment of these lands at the village rates.

91. The amount estimated for survey and settlement was Rs. 986, the actual expenditure, exclusive of the salary and the travelling allowance of the Settlement Officer to end of December 1889 was Rs. 997-15-8. It is now estimated that the total aggregate cost will be about Rs. 1,621-8-4 up to March 1890. This increase in expenditure is said to be mainly due to frequent changes of Settlement Officers. Objections were disposed of amicably.

92. *Kharikasuli, &c., in Bogree.*—This estate also comprised four villages, Upper Kharikasuli, Lower Kharikasuli, Bunderboni and Jharia, and contains an area of 219 acres. There are 193 tenants, all of whom hold their lands at fixed rates. Besides these there are 11 korfa raiyats. The mehal is a permanently-settled estate, and is owned by Messrs. Watson & Co. as patnidars. They

represented to the Collector that they had experieneed difficulty in realizing rents from the tenantry, and prayed for a survey and settlement under the provisions of Chapter X of the Tenancy Act; which was sanctioned by the Commissioner. The rental according to present settlement is Rs. 541 as against Rs. 424, the previous jama, the increase being due to assessment of newly-cultivated lands. The amount originally estimated for the survey and settlement was Rs. 478, out of which Rs. 236-12 was expended exclusive of the salary and travelling allowance of the Settlement Officer and the cost for copying and comparing the records prior to their distribution to the raiyats under rule 35.

93. *Gur Prausattampore.*—The survey and settlement of the estate were undertaken on the application of the landlord, a new purchaser, who alleged that he was unable to realise rents. The settlement was completed and the final report was submitted during the year. The total area by measurement is 536 acres. The rental settled, which was accepted by the landlord and raiyats, is Rs. 1,131, the Government revenue being Rs. 348. The total expenditure was Rs. 563.

94. *Purbapitpore.*—The survey and settlement of this estate were undertaken on the application of the landlord, under section 103 of the Tenancy Act. The settlement was completed during the year. The landlord had no jamabandi papers to produce. The rents settled amounted to Rs. 2,366 against a rental of Rs. 1,768 shown in the road cess papers. The increase is chiefly attributed to assessment of reclaimed lands.

The total area according to survey is 807 acres, and the total cost of the operations Rs. 1,116.

95. *Kodalia.*—The survey and settlement of this estate were undertaken on the application of the landlord, a new purchaser, because of a combination of the tenants who refused to pay him rents. The survey was completed, and the draft records were published. Objections were disposed of, and the final report was submitted during the year.

The rent settled was Rs. 1,260 against a rental shown in the road cess papers of Rs 1,056, the Government revenue being Rs. 606. The increase is mainly due to assessment of reclaimed lands. The cost of survey and settlement, exclusive of salary of the Settlement Officer, was Rs. 255.

96. *Kripanandapore.*—The survey and setttlement of this estate was ordered by the Commissioner in January 1889 under rule 42, Chapter VI of the Rules under the Bengal Tenancy Act on the application of the landlord, who alleged that the raiyats had withheld payment of rent. The estate contains about 277 acres, and the proceedings were estimated to cost Rs. 386, which the applicant proprietor deposited. No jamabandi papers were produced by the landlord. The present settlement shows a rental of Rs. 1,211-14-7 against Rs. 1,211-13-3, the amount entered in the road cess papers, the Government revenue being Rs. 673-8-7. Exclusive of the salary and travelling allowance of the Settlement Officer, the operations cost Rs. 246-8, and were brought to a close in March 1890.

97. *Gur Moyna.*—This estate contains an area of 412 acres, the survey and settlement of which was sanctioned by the Commissioner in July 1889, and was estimated to cost Rs. 507. Owing to delay in depositing the costs, the survey was not commenced until January, and was completed in March.

98. *Dakhin Moyna.*—The area of this estate is said to be 471 acres, the survey and settlement of which was sanctioned by the Commissioner in July 1889, the measurement did not commence until March last, and is yet pending.

99. *Rajnagar.*—The survey of this estate was ordered by the Subordinate Judge of Midnapore under section 158 of the Tenancy Act. It was taken in hand and completed by the Settlement Officer in February 1890. The Settlement Officer was directed to report to the civil court the result of the points referred to him, together with the evidence taken by him. He has done so, and the civil court has decided the points in dispute in accordance with his finding.

100. Landlords in Midnapore, (where rents appear to be very high), have had recourse to section 103 of the Tenancy Act with a view to settle disputes between them and their raiyats, to a greater extent than in other parts of the country. These petty settlements were at first inefficiently conducted,

but many of them have been completed, and the others are now close to completion. As the landlords have obtained an increase in the rents shown in the road cess papers, and the raiyats are reported to have agreed to the rents settled, the results may be considered to be satisfactory.

General remarks on surveys and settlements conducted under the Tenancy Act.

101. It will be observed that survey and settlement operations under the Bengal Tenancy Act have extended over a vast area, comprising Government, Wards' and private estates, in many districts and in every Division in which the Act is in force; that these operations have affected a large number of tenants aggregating at least four hundred thousand; that an increase of rent and revenue amounting to more than a lakh of rupees has been actually obtained with the consent of the raiyats concerned, in the estates of which settlement has been completed or is approaching completion, yet in no single case has any rioting or disorder been reported, nor has anything like opposition of a formidable character been experienced. The number of appeals to the Special Judges from the decisions of Settlement Officers, compared with the number of such decisions, was exceedingly small. It may therefore, I think, be said that the anticipations of those who thought that these operations would lead to confusion and disorder have been wholly falsified by events. The cost of the professional survey operations has in some cases been in excess, and the cost of the settlement operations has been generally less than was estimated. On the whole the cost has been about 8 annas per acre. Where highly paid and efficient officers like Mr. Collin have been in charge of the operations, they ultimately cost less than where, as in some of the Wards' estates in Dinagepore, lowly paid and inefficient officers were employed. The status was recorded, and the rents were settled of 171,647 tenants, of whom 5,604 are cultivating tenure and under-tenure-holders, 1,503 were recorded as raiyats at fixed rates, 102,727 as settled raiyats, 3,363 as settled but non-occupancy raiyats, 20,894 as non-occupancy raiyats, and 37,556 as under-raiyats. These figures show that the number of—

Tenure and undertenure-holders is ...	3	per cent.	of the whole.
Settled raiyats	60	„	„
Non-occupancy raiytas ...	12	„	„
Raiyats at fixed rates ...	1	„	„
Occupancy, but not settled ...	2	„	„
Under-raiyats ...	22	„	„
	100		

CHAPTER II.

ANALYSIS OF DISTRICTS.

102. Mr. A. C. Sen submitted a careful analysis of the Dacca district, which was sent to the Commissioner and Collector for their remarks, and has since been returned. Both the Commissioner and Collector speak highly of the report, and approve of nearly all the suggestions made in it. Some new and important facts in connection with the physical geography and geological formation of the district are brought to light in Mr. Sen's report. The existing system of agriculture is carefully described, and suggestions for improvement are offered.

These suggestions may be summarised thus:—

(1) One of the most important physical features of this and other riparian districts is the constant changes in river courses, in consequence of which churs or small islands are thrown up in the midst of streams near one of the river banks, and large tracts of land are carried away by the encroachment of the river on the other side. These changes prove a fruitful source of litigation, and lead to serious disturbances of the peace, which, the Collector says, are inconsistent with good administration. Mr. Sen proposes that the Collector should be empowered to decide, summarily, the question of possession in such cases, and that a staff of surveyors should be permanently employed for the purpose of mapping the changes which take place from year to year.

(2) He points out that, in Dacca and other districts similarly situated, rivers, khals, and boats form more important means of communication than

roads, bridges and carts. In many cases the principal, if not the only, means by which native boatmen can get their boats up stream, with a strong current, flowing against them is by towing, known locally as *gooning*. It is therefore an object of importance that towing-paths should be kept in order. At present they are entirely neglected. Mr. Sen suggests that they should be taken charge of and kept in order by District Boards. I am in communication with the Collector on the feasibility of carrying out these proposals.

(3) Mr. Sen further states that the cultivation of cotton, potatoes, wheat, and sugarcane in the Dacca district might be improved with much advantage, and that creaks and public watercourses, which here, as elsewhere in Bengal, are silting up, should be taken charge of by Government.

The report of the Lohardugga district by Mr. B. C. Basu is under revision, and will shortly be sent to the Commissioner and Collector of Chota Nagpore for their remarks.

Mr. Basu, in his report, draws special attention to the scantiness of supply of food-grains in Lohardugga, which makes it necessary for the poorer sections of the population to supplement cereals by wild products gathered in the jungles; to the general indebtedness to Hindu money-lenders of the aboriginal peasantry; to the increasing efflux of what are called "free" emigrants from the district to the almost entire extinction of registered emigration; to the extremely backward character of the agriculture of the district; to the deficient supply of manure; to the rapid extension of cultivation, and the consequent diminution of the grazing area, which has led to a large decrease in the number of cattle. The Sudder subdivision of the district, comprising the plateau of Chota Nagpore Proper, possesses, in Mr. Basu's opinion, almost perfect immunity from famine, while the subdivision of Palamow is as liable to it as the adjoining districts of Behar.

Messrs. B. C. Basu and N. N. Banerjee are now employed in preparing analyses of the Nuddea and Cuttack districts.

In connection with the duty of supervising agricultural improvements in Government and Wards' estates, Mr. Basu visited the Western Dooars in Julpigoree, and submitted a report regarding the agricultural resources of the Western Dooars. The report suggests various improvements, among which are the reclamation of jungle land by the opening out of roads and markets; the provision of supply of good water; and the introduction of potatoes, vegetables, and various crops suitable for cultivation in the estate. Major Boileau, the Deputy Commissioner of Julpigoree, has generally concurred in Mr. Basu's recommendations. The cultivation of potatoes and various vegetables was tried by some of the raiyats, and was found successful.

CHAPTER III.

RENT AND REVENUE IN PRECARIOUS TRACTS.

103. It was noticed in last year's report that crops in large tracts of Midnapore had been destroyed or damaged by floods; that a committee, consisting of Major MacArthur, Mr. Reily and myself, had been deputed to enquire into the causes, and that a report had been submitted, in which these causes were analysed and remedial measures were suggested. Some of these measures were adopted, with markedly beneficial results, during the year under report, and others have lately been approved by Government. The realisation of rent from the tracts submerged by flood—to which certain parts of Bengal are peculiarly liable owing to the system of embanking rivers, thus in time raising their beds above the level of the surrounding country—must always be precarious. The question of the best means of securing such tracts from inundation is one of great difficulty, but it comes within the province of the Public Works rather than of the Agricultural Department.

CHAPTER IV.

MEASURES OF PROTECTION AND ARBORICULTURE.

Burmah Emigration.

103A. At the conference of the Directors of the Departments of Agriculture held at Delhi in 1888, the question of relieving the surplus population of overcrowded districts was discussed, and it was suggested, with reference to the congested districts of Behar, that it would be desirable to obtain and circulate

information as to the precise terms on which lands could be had in Burmah, the nature of the soil, and the prevailing climatic conditions. The Government of India subsequently expressed a wish that the Government of Bengal should depute an officer to Burmah, for the purpose of discussing with the local authorities, the procedure which should be adopted in order to attract settlers from Behar and the terms on which lands might be obtained. In March 1889 it was suggested that the most practicable way to test the feasibility of promoting emigration to Burmah would be, to take some representative zemindars and capitalists to Burmah, to show them the lands that may be available for settlers from Behar, and to let them decide for themselves whether it would be desirable for them, to take such lands, and to settle Behar cultivators on them, on such terms as might be agreed upon. This proposal was accepted by the Government of Bengal, and I was deputed, accompanied by Rai Jai Prakash Lal, Manager of the Dumraon Raj; Mr. Hudson, Secretary, Behar Indigo Planters' Association; Mr. G. Walker, of Messrs. Gisborne & Co., and a party of cultivators from Dumraon. The results of the visit were—

(1) That detailed rules were drawn up and approved, under which land can be obtained, in Burmah, on very favourable terms by Behar cultivators and capitalists.

(2) That Rai Jai Prakash Lal, Manager of the Dumraon Raj, applied for and obtained a grant of fifteen thousand acres of land in one district, for settlement upon it of Behar cultivators, and that another Behar gentleman applied for and obtained a grant of fifteen thousand acres of land in another district.

(3) That the Chief Commissioner of Burmah undertook to pay a subsidy of Rs. 8,000 per annum to the British Indian Steam Navigation Company, with a view to encourage immigration to Burmah, on the condition that the Government of India or the Government of Bengal was willing to pay a similar amount for encouraging emigration from Behar. The precise terms on which this subsidy is to be granted are still under the consideration of Government.

Forest and Fuel Reserves.

104. In accordance with the orders of the Government of India, enquiries are being made with a view to ascertain what lands are available for purposes of fuel and fodder reserves, in the neighbourhood of recently constructed or projected railway lines. It has been ascertained that suitable lands can be obtained near the Assam-Behar line, in Dinagepore, near the Tirhoot extension line, in Chumparun, near the East Indian Railway in the country between the Khanu Junction and Lukeeserai. In the country through which the Bengal-Nagpore Railway passes, there would be no difficulty in selecting land suitable for fuel and forest reserves, nor would there be any in the country through which the projected line from Chittagong to Assam will pass. The question for consideration in all these cases is, are there any funds available for the acquisition of such lands? If there are, then fuel and fodder reserves can be established near all the lines named.

The question of the future management of those parts of the Khymore hills over which Government exercises a right of easment, but is not proprietor, is still under consideration. There is now unanimity of opinion, that the Ruhul and Rhotas plateaus of which Government is sole proprietor, should be converted into fuel and fodder reserves, and managed by the Forest Department.

Planting of trees along roadsides.

105. The subject continued to receive attention during the year. A list of plants available at the Botanical Gardens at Seebpore was again forwarded to all Commissioners of Divisions with a view to their applying to Dr. King for the plants mentioned in it. 58,901 plants and 3,619 packets of seeds were supplied, as against 31,183 in the previous year. The increase is attributed, by Dr. King, to the interest awakened in the subject by the efforts of this Department.

Planting of fruit-trees in Hazaribagh.

106. Apple, pear, orange, peach and plum trees which were supplied last year to certain gentlemen at Hazaribagh and Ranchi are thriving. At Ranchi the peach and apple trees are bearing fruit. At Hazaribagh some of the apple trees are also bearing fruit. The plum and pear trees have grown to the height of 6 or 7 feet, but have shown no signs of blossoming. The success of grape vine supplied to the Superintendent of the Reformatary School at Hazaribagh has, it is reported, been most surprising.

Date-palms.

107. The Deputy Commissioner of Hazaribagh reports that of 400 seedlings of date-palm reared from seeds during 1888, 163 have died, and the remainder, 237, are in good condition, and have grown about 12 inches in height. Some seeds were also supplied to the District Engineer, Patna district, who reports that 85 young trees have survived and are thriving.

The Collector of Shahabad reports that the seeds of the date-palm sown in the Arrah, Buxar, and Dumraon gardens are in good condition, and that they have grown to a height of 2½ feet. Some seeds were also sown at Sasseram, from which 10 plants have appeared above ground.

Eucalyptus tree.

108. It was stated in last year's report that eucalyptus plants which had been introduced in Hazaribagh and Lohardugga did not thrive there. The Deputy Commissioner, Hazaribagh, now reports that the plants that were topped last year have thrown out lateral branches and are in good condition. The Superintendent, Tributary Mehals, has lately been supplied with some eucalyptus seeds.

Divi-divi tree.

109. The Deputy Commissioner, Sonthal Pergunnahs, reports that there are now about 360 divi-divi trees in the compound of Kati Kund bungalow, and that they are thriving.

Inga Samun (rain tree) and Abbizzia Procera.

110. It was mentioned in former reports that Mr. Maries, who was formerly Superintendent of the Maharajah of Durbhunga's gardens, experimented with these trees on "usar" lands, and that he found that not alone did they grow, but that they had the effect of reclaiming the land. Seed was therefore distributed in the districts of Behar and Bhagulpore for experiment.

The Commissioner of Bhagulpore reports that the seedlings planted in Maldah are thriving, but the seedlings did not thrive in Monghyr. The Commissioner of Patna reports that the seedlings planted in Sarun, Mozufferpore, Patna, and Shahabad are thriving. Mr. Hudson says these trees appear to grow best in *usar* land, where nothing else grows, while others say the plants have no effect in the reclamation of *usar*. It is premature to form an opinion on the subject.

Vanilla.

111. Cuttings of vanilla, which produces pods of high commercial value, were supplied to Mr. Doobay, Manager, Gurgung Jhora Tea Estate, Dooars, who reports that they are thriving.

SILK EXPERIMENTS AND ERADICATION OF PEBRINE.

112. From the 1st of March 1889 the entire management of silk experiments, being made with a view to the eradication of *pebrine*, including the disbursement of funds connected with them, was taken over by a Committee of merchants interested in the trade in silk, with Sir Alexander Wilson as President, and the services of Mr. N. G. Mookerjee were placed at their disposal. One outcome of the early meetings of the Committee was, the establishment of independent rearing nurseries at Surdah and Barogurreah, where it was arranged that *industrial seed* for distribution should be raised from carefully examined

seed, supplied by the central nursery at Berhampore. The result of the working of these independent rearing establishments, however, proved unsatisfactory owing to muscardine, and the out-rearing system was at once abandoned.

The experiments conducted at the central seed nursery showed that, where seed was properly selected and examined and then issued, the crop was invariably satisfactory. The March rearing of 1889 was very successful, and the seed was distributed to over 500 villagers in the silk district. On the other hand, in May the experimental crop of cocoons proved a failure, owing to the disease *Rosa* or Grasserie, which is induced—

(1) by violent variations of temperature;
(2) if the worms are placed in a current of air;
(3) if they are fed with mature leaf at early stages and tender leaf at the last stage.

All the cocoons which survived this disease, though poor, proved to be very good seed, only 25 per cent. being affected by *pebrine*. In order to provide seed for the July bund, an experiment was made to raise seed from *deshi* cocoons, but the result was not successful, for on examination it was found that only a little more than one-third of the layings were free from *pebrine*. The September rearing suffered in quantity, giving only one-half of the expected results. The loss was attributed to what among silk-rearers is known as *flacherie*, arising from the use of damp and fermented leaf. The crop was otherwise an excellent one. It may be observed here that the rearing in the month of September is the most important one of the year, from which the entire November bund is produced. The second in importance as a seed bund is that of January, which in the year under report was, in the opinion of the Committee, unsatisfactory in its results. The March bund was a failure throughout the district owing to muscardine. In October a proposal was made by Mr. Mukerjee to establish a Sericultural Laboratory at Seebpore away from silk districts, but it appeared inexpedient to the Committee to change the locality of the central nursery from its present site, as the advantages to be gained from segregation, would be "more than counteracted by the great distance from the seed-distributing agencies, and the increased difficulty of exercising any supervision." The Committee, however, adopted the proposal to have microscopically selected seed reared at certain places distant from the silk districts, with a view to guard against infection from *pebrine*, and arrangements were made for rearing at Alipur, Pokhurea, Kalimpong, Nagri, Dehra Dun, Pathankot, Gwalior, and Kashmir. At Pathankot and Dehra Dun the rearing on the March bund was entirely successful, and equally satisfactory results are expected in other places. The following table shows the results of the experimental rearing from 1st March 1889 to 30th March 1890.

Bund.	Total quantity raised.	Seed used for office.	Seed distributed free.	Experimental Sunch sold.
	K.	K.	K.	K.
March ...	931 8 0	11 8 0	2 0 0	61 0 0
May ...	224 8 0	25 0 0	.....	70 0 0
June ...	408 8 0	25 8 0	.....	51 8 0
August ...	634 15 0	59 6 0	3 6 0	106 10 0
September ...	802 8 0	0 10 0	64 8 0	638 0 0
November ...	1,569 10 4½	5 0 0	130 0 0	61 8 0
January ...	907 3 0	2 0 0	125 0 0	369 11 0
March ...	1,816 8 0	.....	55 0 0	.....
	7,295 4 4½	138 6 0	279 14 0	1,358 5 0

These figures indicate that the results of the experiments have not been altogether satisfactory, no particular eagerness was evinced by the villagers to buy the examined seed, and in fact in most bunds healthy seed was not raised in the experimental nurseries. The Committee were not satisfied that the supervision exercised in the rearing and selection of seed was as close as it might have been, but they trust that Mr. Mookerjee will, with careful management, be able to show better results in the present year.

113. In addition to the silk experiments at Berhampore, others of a similar nature were conducted at Chattragunge in the district of Midnapore, the management of which was put into the hands of Mr. Keighly. A disused indigo factory was put at the disposal of the Silk Committee for this purpose by Messrs. Robert Watson and Company. Though necessarily conducted on a very small scale, the experiments proved very successful. The cocoons reared by Mr. Keighly were superior to the ordinary village cocoons of the district, "running 16 puns to the seer as against 20 to 25, and the silk reeled from them gave 2 seers to the maund as against $1\frac{5}{16}$ to $1\frac{1}{2}$ of the others," and the demand for the seed was more than could be met. Mr. Keighly claims that he has discovered a simple method of detecting pebrine and other diseases independent of the microscope. The efficacy of his method will soon be tested.

Insects injurious to crops.

114. During the year under report several specimens of insects injurious to agricultural crops were obtained from district officers, and forwarded to Mr. E. C. Cotes of the Indian Museum for examination, and with a view to his suggesting means of mitigating the injury caused by them. Mr. Cotes has embodied all the information supplied to him in notes entitled "Notes on Indian Insect pests" and "Notes on Indian Economic Entomology," which have been distributed.

Locusts.

115. In accordance with the orders of Government, Divisional Commissioners, Settlement Officers, and Agricultural Officers, were asked to furnish any information they could gather on the subject of the injury done by locusts, and from the replies received it appears that locusts have not done very great damage in Bengal, in recent years.

The Settlement Officer of pergunnah Sarail reports that there was an invasion of locusts in that part of the country six or seven years ago. They did no appreciable damage to the paddy, which had become ripe and hard, but other crops suffered from their ravages. Protective fences were found partially efficacious in obstructing their flight.

The last locust flight in the district of Dacca was so far back as 25 years ago. Locust plagues are now unknown there.

In Shahabad the last locust plague occurred 11 or 12 years ago. No great damage was, it is reported, done to crops, and no special steps were taken to prevent their flight.

CHAPTER V.

AGRICULTURAL EXPERIMENTS, INCLUDING FARMS.

116. Agricultural experiments are now being carried on, in Bengal, in three small experimental farms, at Dumraon, Burdwan, and Seebpore, and in some Government, Wards' and private estates. Mr. B. C. Basu is in charge of the farms at Dumraon and Seebpore, and the farm at Burdwan is under the supervision of Mr. Reily, Manager of the Burdwan Raj, who works in consultation with Mr. N. N. Bannerjee.

DOOMRAON FARM.

117. *Wheat.*—Experiments with wheat were designed to test the relative merits (1) of deep and shallow ploughing, (2) of various manures, (3) of canal and well-water for irrigation, and (4) of several varieties of wheat. The following results are of interest:—

(1) Deep ploughing where wheat was sown alone, yielded a larger outturn than shallow ploughing at the same cost, the increase last year having amounted to 2 maunds 4 seers of grain and 4 maunds 16 seers of straw per acre. But when wheat was sown mixed with gram no increase was obtained from deep ploughing.

(2) Saltpetre, as in previous years, again proved a very good and profitable manure for wheat, as will appear from the statements given in the appendix. Cowdung and ashes also proved beneficial and profitable. Green manuring again failed to produce any increase in the outturn of wheat.

(3) In the past season, the irrigated plots produced no increase in outturn over the unirrigated plots, owing to timely rainfall, which dispensed with the necessity for irrigation: there was no difference in outturn between the plots irrigated from well and from canal water.

(4) Mozuffernagar wheat, the seed of which was imported for cultivation in Doomraon Farm in 1885, yielded a much heavier outturn than the local red wheat in the first two years; but since then it has been deteriorating in point of productiveness, as well as in the quality of grain. Last year the outturn of Mozuffernagar wheat per acre was less than that of the local red. The local Buxar club wheat is as good a grain as is produced in India, if not the best in all India.

(5) *Sugarcane.*—The Mauritius system of planting, which had proved successful in the previous year, yielded a poor outturn in the year under report owing to the trenches in which the cuttings had been planted having become water-logged. The cultivation of *samsera* cane was tried, but did not prove encouraging.

(6) *Potatoes.*—Excellent potatoes were grown from acclimatized English seed imported from Darjeeling. The outturn of Darjeeling potatoes was also larger than that of the local variety, of which the seed is annually imported from Bettiah. The high price of the Darjeeling seed and the extremely low price (about 12 annas a maund) at which potatoes sold in Doomraon, rendered the cultivation of Darjeeling potatoes unremunerative in the farm.

(7) *Fodder crops.*—As in the previous year, *jowar* yielded a heavier outturn of fodder than *sorghum*. Lucerne has been cultivated for the last three years, with the result that, although a good crop of fodder was obtained, it failed invariably to produce seed.

(8) *Maize.*—The results of experiments made with Canadian and country maize, during the past and the previous years, show that the former has been gradually deteriorating in quality, so that it shows no superiority now to the country maize. In point of productiveness, the Canadian, which was a heavier crop in the beginning than the country variety, proved inferior to the latter in the last season.

(9) *Paddy.*—The scarcity of rain in August caused some injury to the paddy crop, especially on the manured plots, which were more forward than the unmanured ones, and were in flower at the time. The benefits derived from the application of saltpetre were neverthless more distinctly felt, as will be seen from the statements appended to the report. As in the previous years, deep ploughing gave a large increase in the outturn over shallow ploughing. The increase amounted to nearly 3 maunds of grain and 6 maunds of straw per acre.

The cultivation of *aus* paddy was tried, but the outturn obtained was poor.

(10) Since the close of the year the Manager of the Doomraon Raj has expressed a desire to have 50 acres of the Maharajah's home farm placed under Mr. Basu's management, with a view to ascertain whether the improvements suggested by the results of previous years' experiments will prove remunerative when applied to a farm of moderate size. Mr. Basu has been instructed to undertake the supervision of the working of the farm.

Burdwan Farm.

118. During the year an area of 14 bighas and 5 cottahs was added for experimental purposes to the land that had already been under cultivation. Experiments were made with the following crops:—Paddy, sugarcane, fodder grasses, jute, cotton, maize, gram, wheat, potatoes, peas, barley, oats and lentils.

(1) *Paddy.*—The results of manure experiments on paddy, which are given in the appendix, showed that the plots treated with manures gave a very slight increase in the outturn, not at all commensurate with the cost of the manures applied. Cowdung proved a better manure for paddy than bonemeal, confirming the experience of previous years; and saltpetre had the effect of increasing the amount of straw, with a corresponding decrease in the quantity of grain.

The results are attributed to the condition of the land, which still contains a stock of inexhausted manurial ingredients.

(2) *Sugarcane.*—The results of experiments with various manures go to show the superiority of *castor cake* over such artificial manures as superphosphate of lime and saltpetre. *Bonemeal* mixed with castor cake distinctly proved to be a better manure than bonemeal by itself, giving a difference in money value of Rs. 25 per bigha, as may be seen from the following figures:—

Manures applied per bigha.	Outturn per bigha.			Total cost of cultivation per bigha.	Price of the outturn per bigha.	Gain per bigha.
	Weight of canes.	Weight of juice.	Weight of *gur*.			
	Mds. s.	Mds. s.	Mds. s.	Mds s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Castor cake ... 7 24 Bonemeal ... 4 16	155 16	95 36	16 2 12	48 3 6	80 4 0	32 0 6
Bonemeal ... 8	84 20	50 16	9 4 12	39 0 0	45 9 0	6 9 0

Ratooning experiments brought out two important points, viz.—

(1) that *khari*, although a thinner looking cane, is much hardier than the *samshara*, and superior also to it for the manufacture of gur, and

(2) that *khari* does not suffer in quality even in the third year of harvesting.

(3) *Fodder grasses.*—From the statement given below, it will be seen, that bone meal applied at the rate of one maund per bigha gave excellent results with *sorghum*, raising the outturn to more than twice that of an unmanured plot—

Manure applied per bigha.	Outturn per bigha.
	Mds. s. c.
Bone-meal, 1 maund	280 36 0
Unmanured	118 0 0

This experiment further showed that *sorghum* succeeds as a rainy-weather crop where it had been found to fail as a cold-weather crop. In the absence of any demand for the grass, the whole of the produce was given to the bullocks of the farm, which did well on it, and used it with the greatest avidity.

The only other grass experimented on was *loari ghas*, which gave a very fair yield. As a fodder, it was not found to be as attractive to cattle as *sorghum*.

(4) *Jute.*—No increased yield was obtained by the use of super and saltpetre, but cowdung gave very good results, showing a net profit of nearly Rs. 28 per bigha. The details will be found tabulated in the appendix.

(5) *Cotton.*—As in previous years, the outturn of the Nankin variety was the largest. Contrary to expectation, all the ratooned plants yielded a larger amount of seed than the fresh sown ones—a result which may be attributed to the heavy rains which interfered with the growth of the new plants.

(6) *Gram.*—The effect of bone-meal on gram is given in the following statement:—

Manures applied per bigha.	Outturn per bigha.		Cost of cultivation per bigha.			Price of yield per bigha.
	Grain.	Straw.	Price of manure.	Cost of cultivation.	Total.	
	Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
No manure	1 20 0	2 3 0	...	4 2 0	4 2 0	3 8 0
Bone-meal, 1 maund	2 22 8	5 25 0	2 0 0	4 2 0	6 2 0	6 2 0
No manure	1 20 0	2 20 0	...	4 2 0	4 2 0	3 8 0

Although the outturn is below the average, the experiment shows that bone meal increases the yield sufficiently to compensate for the extra cost of the manure.

(7) *Wheat.*—The object of the wheat experiments was to test the effects of bone-meal and saltpetre. The outturn of the different plots is tabulated in the following statement:—

Manures applied per bigha.	Outturn per bigha.	
	Wheat.	Straw.
	Mds. s. c.	Mds. s. c.
Unmanured	0 37 8	1 32 0
Bone-meal, 1 maund ...	2 20 0	3 38 0
Unmanured	1 27 13	2 20 0
Ditto	0 39 0	1 36 0
Saltpetre, 10 seers ...	1 28 0	3 20 0
Unmanured	1 20 0	2 0 0

These figures show a very low outturn, for want of irrigation, but they support the experience of previous years in that bone-meal yielded the largest produce. The average of the unmanured plots gathered from the above will give an outturn of only 1 maund 11 seers of grain per bigha, whereas the yield of the bone-meal plot was 2 maunds and 20 seers, a result which must be regarded as satisfactory. Saltpetre also increased the yield by 17 seers, but this was not sufficient to compensate for the increased cost.

(8) *Potatoes.*—Three plots were sown with English, side by side with country, potatoes, and treated with the same manures. The results clearly showed the superiority both in quality and quantity of the English seed, but the superior tubers did not fetch a higher price in the local market.

A table illustrating these results is given in the appendix.

(9) *Barley and oats.*—Manure experiments with these two cereals showed the usefulness of saltpetre and cowdung. To the barley crop an application was given of 50 maunds of cowdung mixed with 10 seers of saltpetre. This raised the outturn of grain as well as of straw by two maunds, as will be observed from the following figures:—

Manures applied per bigha.	Outturn per bigha.	
	Barley.	Straw.
	Mds.	Mds.
1. Cowdung, 50 maunds ... / Saltpetre, 10 seers ...	5	6
2. Unmanured ...	3	4

The oat crop, which received only 10 seers of saltpetre, also gave an increase of nearly 2 maunds of grain, yielding a profit of Rs. 2 per bigha.

SEEBPORE FARM.

119. In the Seebpore farm experiments were made last year with *aus* paddy, jute, wheat, barley, oats, sugarcane, potatoes, sorghum, and *Abroma augusta* (*ulatkambal*).

(1) *Aus paddy.*—The experiments were designed to test the effects of bone-meal, oilcake, saltpetre, and cowdung. The results were not conclusive. The plot manured with saltpetre yielded an increase of 1 maund 12 seers of grain over the unmanured plot, but the value of the increase did not compensate for the increase in the cost of cultivation.

(2) *Jute.*—An increase in yield of 1 maund 27 seers of jute, valued at Rs. 7-11-6, was obtained from the application of 2 maunds of castor-cake, valued at Rs. 3. Bone-meal applied at the rate of 2 maunds per bigha, valued at Rs. 4, yielded an increase of 1 maund of jute, valued at Rs. 4-8-6.

(3) *Barley.*—Experiments were designed to test the effects of various artificial manures on the crop. The manured plots gave in each case an increase in outturn over the unmanured plot, but the value of the increase, did not equal the cost of the manures. Saltpetre, applied at the rate of 50 seers per bigha, produced an increase in outturn of 3 maunds of grain and 2 maunds 36 seers of straw.

(4) *Oats.*—Oats were cultivated last year for the first time in the Seebpore farm, and were found to yield a satisfactory outturn. Owing to the heavy rainfall in November, the sowing was late, and in consequence the grains did not fill in properly, but the value of the outturn covered the cost of cultivation in every-plot.

(5) *Potatoes.*—The heavy rainfall in November seriously interfered with the planting operations ; the outturn was in consequence poor. Of the manures, a mixture of castor oil cake and ferrous sulphate yielded the heaviest outturn. The potatoes grown on the farm from English, Darjeeling, and Naini Tal seeds were of excellent quality, and fetched Re. 1 per maund, more than the country variety of potatoes.

(6) *Sorghum.*—Experiments made with this crop last year confirmed the opinion expressed in the Annual Report of the previous year that sorghum can be profitably grown as a fodder crop in Bengal. The produce was sold at 2 annas 6 pies per maund to a Calcutta dairy, the Manager of which, Mr. G. C. Bose, a Cirencester scholar, reported very favourably on it. The yield of milk of a number of cows was increased from 20 to 25 seers by the substitution of sorghum for straw ; while the cost of feeding was at the same time reduced. Mr. Bose has been so far encouraged by the results, that he proposes to grow sorghum as a fodder for his milch cows. The cultivation of sorghum realized a net profit of Rs. 12-12-3 per bigha.

(7) *Ulatkambal* (*Abroma augusta*).—The results of the cultivation of this wild fibre plant were not favourable, an outturn of only 1 maund 37½ seers of fibre having been obtained per bigha.

Ryots' Demonstration Farms.

120. During the year demonstration farms were opened by Mr. Reily in five mehals of the Burdwan Raj, viz. Hukmapur, Nayor, Kanurambati, Bhedia Nursingpur, and Sayadpur, in order to bring home to the cultivators a knowledge of the results of certain experiments which proved satisfactory in the central farm. Experiments were made only with potatoes, but the financial results were not satisfactory as the expenditure exceeded the receipts by Rs. 73-14-6.

Mr. Reily attributes this to the novelty of the experiments, which must not, he says, be judged by the results of one year.

Potato cultivation in the Darjeeling district.

121. It was noticed in the Annual Report of the last year, that the results of the experiments in potato cultivation in the Darjeeling Hills had shown that the place was full of disease-germs, and that for some tmie to come it would appear to be unlikely that healthy potatoes could be grown in Darjeeling. In order to investigate the spread of the disease, Mr. Basu visited the Darjeeling district in December last, and made enquiries of several European and native gentlemen who were known to take interest in the cultivation of potatoes. From these enquiries and from the results of experiments made in the previous season, it was supposed that the disease might be mitigated by growing potatoes only on newly-reclaimed land, by avoiding the use of tainted seed potatoes, by avoiding the use of dung, which may have harboured the germs of the disease, by using ashes and chemical manures in its place, and by planting the crop early in January, so that it may be gathered in before the rainy season begins. In order to practically test these measures, fifty maunds of Sutton's seed potatoes were imported from England, through the Agri-Horticultural Society of India, and distributed among a certain number of European and native gentlemen and hill cultivators. The potatoes were planted in January and the first fortnight of February ; but the sowing was immediately followed by an unusually long drought, which extending up to the second week of April retarded germination. Notwithstanding this drought, the crop was reported to be in a healthy condition until the beginning of June, when the blight made its appearance and again spread with great rapidity over the district. The reports of the results of these expriments have not yet been received; but it is feared that potato experiments in Darjeeling will be as fruitless as they were in the previous year.

USE OF, AND TRADE IN, BONES IN BENGAL.

122. The Government of India, in their No. $\frac{67}{12-1}$A, dated the 4th October 1889, have invited the attention of Local Governments to the increasing exportation of bones from India, and asked the Provincial Department of Land Records and Agriculture to embody remarks on the use of, and trade in, bones in their annual reports. The following is the information which has been gathered on the subject—

(1) *Source and use of bones.*—Within the last few years the collection of bones from village wastes, for exportation to Calcutta has become the regular profession of a low caste of Hindus—Chamars—in the central and western districts of Bengal Proper, and is gradually extending to the outer parts of Bengal, in proportion to the increasing demand of the Calcutta mills, and the extension of railway communication. Heaps of raw bones collected for transport to Calcutta may now be seen along the railway and principal river routes of Bengal. Bones are also collected by the indigo-planters of Behar for use on their indigo land. Many of them have erected mills for grinding them to dust. In Lohardugga many tea-planters make their own bone-meal, and use it as a manure for tea plants. The bones are collected locally, and coarsely ground by the *dhenki*. The fragments are not so fine as are turned out by the mill, nor are they required to be very fine for a slow-growing perennial like tea. The bones brought into Calcutta are bought up for manufacture into bone-meal. There are four or five bone-grinding mills at the present time in and near Calcutta. With the exception of a comparatively small quantity of bone-meal sent out to tea-gardens, the whole of the output of the mills is destined for export.

(2) *Price of bone-meal in Calcutta.*—The price of bone-meal ranges from Rs. 2 to Rs. 2-8 per maund. There are several sorts (about 10 in number) distinguished according to degrees of fineness and purity, the best of which resembles *satu* or parched barley-meal, both in fineness and colour.

(3) *Means of producing bone-meal cheaper in Bengal.*—Raw bones as they come from the Chamars may be bought in the mofussil at eight annas per maund or less. In the tea-gardens in and near Ranchi they are delivered by the collectors at the rate of five annas a maund. At Dumraon in Shahabad bones have been collected at a cost of four annas a maund, and at Julpigoree Mr. Donald Sunder, Settlement Officer of the Western Dooars, has arranged with Chamars to have bones delivered at the jail at a price not exceeding six annas a maund.

A comparative trial was made in the Seebpore farm as to the relative merits, in grinding bones to dust, of the *dhenki* and an English-made bone-mill supplied to the Department by Messrs. T. E. Thomson and Company. The results were that it cost two annas a maund less to prepare bone-meal with the *dhenki* than with the mill. Under the circumstances, the *dhenki* can be safely recommended as a cheap and effective means of crushing bones. If ryots ever take to the use of bone-meal for manure, they will not have recourse to complicated machinery, but will use the *dhenki* in very much the same way that they grind wheaten and barley flour themselves, rather than buy the machine-made article.

(4) *Experiments in bone-meal through ryots.*—Numerous experiments to test the efficiency of bone-meal as a manure for paddy, have been made in Burdwan and Hooghly. It is not always possible to show the results of the experiments in bone-meal in the form of a statement comparing the outturn of plots manured with it, with that of unmanured plots, for these reasons—(1) that in most of the experiments bone-meal was mixed with saltpetre, hide-salt, &c., so that it cannot be ascertained how much of the increased yield was due to each of these manures; and (2) that the experiments made by ryots are devoid of precision and cannot be thoroughly relied upon. The best guide to the value of this manure, would be the evidence of the ryots who have tried it. In the Annual Report for 1886-87 mention was made of the steadily increasing demand for bone-meal in villages where it had been used in the preceding year. The results of the ryots' experiments in this year were also encouraging, as the figures given in the Appendix H show. They give an average increase of 570 lbs. of paddy per acre obtained by manuring with 240 lbs. of bone-meal. The money-value of the increase in a year of ordinary prices may be taken as Rs. 9-8, while the price of 240 lbs. of bone-meal

applied is only Rs. 6 at its present high price in Calcutta. Experiments made with bone-meal, on paddy, did not succeed in 1887-88 owing to great deficiency of rainfall; and in the following year (1888-89) they totally failed on account of floods, but the ryots who made the experiments appear to be very much interested. Last year an application was received from a single person for 50 maunds of bone-meal, which was supplied and paid for by the applicant. Enquiries were made in some of the villages in which bone-meal had been distributed in previous years. The testimony of the ryots and farmers was, according to Mr. Basu, nearly uniformly to the effect—

(1)—That bone-meal is quite as good a manure for paddy, potatoes, and sugarcane (the chief crops of the village) as oilcake.

(2)—But that its effect does not last for more than a year, and according to some, a field manured with bone-meal will yield heavily in the first year only.

(3)—That better results were obtained in sandy than in clayey soils.

In Hooghly and Burdwan oilcakes (castor-cake in particular) are now being very largely used as manures not only for sugarcane, potatoes, and various vegetable crops, but also for paddy, the chief staple of these districts. Although bone-meal is acknowledged to be a good manure, oilcake is believed to be superior to it in many respects. Besides that it is much cheaper than bone-meal, it is open to no objection on the ground of caste feeling. Until, therefore, bone-meal can be offered at cheaper rates than oilcake, there is no hope of its general adoption in native agriculture.

(5) *Experiments in Farms.*—Experiments to test the efficacy of bone-meal as a manure for paddy were made in the Burdwan and Seebpore farms. The results are given in the appendix.

The increase in yield was very remarkable, and is valued at about Rs. 13, while the cost of the bone-meal was only Rs. 6. The results of similar experiments in the succeeding two years were, however, very conflicting.

On the Burdwan farm in 1885-86 two plots of Buxar wheat were contrasted, one being manured with bone-meal at the rate of six maunds per acre, and the other left unmanured. The former yielded 1,080lbs. of grain to the acre, while the latter only 480lbs. The value of the increase (600lbs.) would be about Rs. 20, and that of the manure applied Rs. 12.

As regards sugarcane and potatoes, bones have been tried either in the form of bone-meal combined with saltpetre, gypsum, oilcake, and other manures, or in the form of superphosphate of lime alone, or combined with one or more of the manures enumerated. It is not possible to formulate the results of these experiments in concise statements. So far as they go, they show that superphosphate of lime prepared from bones, is a valuable manure for both sugarcane and potatoes.

The best testimony as to the remunerativeness of bone-meal as a manure, under certain conditions, is to be found in the fact that many indigo-planters of Behar, and tea-planters of Assam, Lohardugga and elsewhere, use it in their own cultivation.

(6) *The introduction of bones as a manure in Bengal.*—A beginning has already been made by ryots in the use of bone-meal as manure in the districts of Burdwan and Hooghly. Arrangements have been made at Belcooly, Pearapole, and Khanian in the Hooghly district, and also in the Burdwan and Dumraon farms, and at Jheria in Manbhoom, to have bones collected and to have them fermented and ground into meal, and then to distribute the bone-meal at cost price to the ryots of the neighbourhood. In this way it may be possible to offer bone-meal at prices not exceeding Re. 1 per maund. At the suggestion of Mr. Donald Sunder, Settlement Officer of the Western Dooars, and with the permission of Dr. Lethbridge, Inspector-General of Jails, it has been arranged to utilize the labour of Mahomedans, low-caste Hindus, and aboriginal prisoners at the Julpigoree and Purulia Jails for the grinding of bones. The bone meal prepared in the jail will be available for sale at cost price, to parties applying for it. Mr. Sunder believes that he will be able to induce the jotedars of the Western Dooars to use it largely. He has already purchased 50 maunds of bone meal from Messrs. Croft, Wells & Co., of Bally, and distributed it among the jotedars of the Western Dooars.

The quantity of bones exported from Bengal is not exactly known, but it can represent only a small fraction of the total quantity available. It is only parts which are easily accessible from Calcutta by rail and river that are visited by bone-collectors, while in Behar and Lohardugga bones are collected and used up locally by the planters. The present export of bones cannot be said to be directly prejudicial to the country. It is better that the bones should be utilized in Foreign countries than not at all, but it would, as a matter of course, be preferable that they should be utilized in India, if this can be done with profit to cultivators.

EXPERIMENTS MADE BY MEMBERS OF THE HORTICULTURAL AND AGRICULTURAL SOCIETY OF INDIA.

123. The report for the four years ending December 1889 has been received. It classifies the work done by the Society under four heads, viz.—

(1) The introduction and distribution of trees, plants and seeds of economic or horticultural value.
(2) The experimental cultivation of indigenous and exotic products.
(3) The collection and diffusion of information relating to agriculture and horticulture.
(4) Inquiries relating to tea fertilizers.

1. The Society distributed 14,647 plants of economic value in the four years ending December 1889. Seeds of cotton, maize, sorghum, reana luxurians, rubber and timber trees were also distributed.

2. The following experiments of special interest were made :—

(1) *Cotton.*—A series of trials was made with different varieties of cotton seed by Mr. J. Cameron for the Mysore Government. The enquiries made by the Society, in connection with the collection of seeds for Mr. Cameron, showed that the American types of cotton can be thoroughly naturalized in this country, and some of the superior varieties may be thus introduced into Bengal with profit.

(2) *Erythroxylon Coca.*—The Society has made efforts to introduce the cultivation of this anæsthetic drug, which have been very successful. The cultivation may be now said to have passed out of the stage of experiment, and it is hoped that private agencies will take it up as a commercial undertaking.

(3) *Musatextilis* (*Manilla hemp*).—A small quantity of fibre prepared from two stems of the Manilla plantain grown on the Society's garden, is reported to have been of good quality.

(4) *Potato cultivation in Darjeeling.*—An attempt was made to cross Solanum tuberosm (ordinary potatoes) with S. maglia, in order to produce a variety which may resist disease, but it failed.

(5) *Sugarcane.*—Mauritius sugarcane cuttings were distributed in 1887, but failed. The cuttings, when received at Kushtia and Saharanpur, were dry and very much shrivelled.

(6) *Tea.*—A kerosine emulsion was tried in a tea-garden in Kangra Valley as an insectide, against the scale insect, and proved efficacious.

3. *Tea fertilizers.*—A joint committee, composed of members of the Society and of the Indian Tea Association, has been formed to make arrangements for complete investigation into soils of tea-gardens, and into the changes which the tea leaf undergoes in the course of manufacture. For this purpose it is proposed to engage the services of a competent European chemist, and money has been subscribed by members of the Tea Association for the purpose.

4. The Society has horticultural gardens in the neighbourhood of Calcutta, and is managed by a Committee. The Government of Bengal contributes Rs. 6,000 per annum to the funds of the Society. The Agri-Horticultural Society does useful work in distribution of flowers, ornamental and other plants, vegetable and other seeds, and in various other ways. The Secretary has given this department such assistance as is in his power, but the functions of the Society would appear to be horticultural rather than agricultural.

(1) ZOOLOGICAL GARDENS.

124. The gardens are under the management of a Honorary Committee, consisting of a President, a Secretary and Treasurer, and several *ex-officio* and ordinary members. Funds are derived from donations and subscriptions, admission

fees, fête receipts, rent, sale of garden animals, and rates levied on visitors for use of garden property, all of which are subsidized by a liberal grant from the Government of Bengal.

During the year 1888-89 one life Governor, one donor, and nine life members were enrolled. The donations and subscriptions amounted to Rs. 7,050, the Government contribution for the year was Rs. 19,504-1-8, and the total net receipts Rs. 52,737-9-6. The total expenditure was Rs. 16,020-13-9, leaving a balance of Rs. 11,278-15-3 in favour of the Gardens on the 31st March 1889, as against an opening balance for the year of Rs. 1,286-14-6.

The number of visitors for the year under report was 111,573, against 108,041 for the year 1887-88.

The Garden is, it is said, beginning to make its usefulness felt as an adjunct to sound nursery education. A large number of students and teachers were admitted free of charge during the year, and in order to afford facilities to such visitors to study birds, the Committee have adopted the plan of putting up pictorial representations to the names, so that they may be easily identified.

COST OF AGRICULTURAL EXPERIMENTS.

125. The total net cost to Government of agricultural experiments and enquiries, conducted under the supervision of the Agricultural Department, and of collection of agricultural statistics and information during the year, exclusive of the salary of the two Agricultural Assistants, has been Rs. 6,034-2-9, or about one-third of the Government contribution to the Zoological Gardens. Whatever else may be said of these experiments and enquiries, it cannot, at least, be said that they are very expensive.

AGRICULTURAL EXPERIMENTS AND IMPROVEMENTS IN WARDS', GOVERNMENT, AND PRIVATE ESTATES.

126. The following is an abstract of the reports received from local officers on agricultural experiments undertaken, and improvements made, during the year under the supervision of local officers with the assistance of this Department in Wards', Government, and private estates:—

(1) RAJSHAHYE DIVISION.—*Private Estates*.—No agricultural improvements were attempted in any private estates of this division, except in the Tagore estate in Rungpore, where dense jungle was cleared by Sonthals, Garos and resident ryots. Agricultural experiments were tried in the Dubalhati and Taharpore estates in Rajshahye. In the former the cultivation of arrowroot was undertaken, and is reported to have been very successful: in the latter experiments were made in—

(*a*) the cultivation of castor seeds, safflower and coffee, the last of which is reported to be doing well,

(*b*) the cultivation of mulberry and the rearing of silk cocoons in some of the tenants' houses.

Several kinds of irrigation pumps were purchased, and an Abyssinian tube-well was indented for from England.

(2) *Government Estates in Rajshahye.*—In the Jaipore estate in Bogra, a new *hât* was opened at a cost of Rs. 735; six new wells were dug at a cost of Rs. 60; some new roads constructed, and old ones repaired. The cultivation of Buxar wheat was carried on, and sissoo and other valuable trees, which had been planted in former years, were maintained at a cost of Rs. 82-5-7.

The Subdivisional Officer of Alipore, in Julpigoree, was supplied by this Department with some Buxar wheat seed, potato and vegetable seed. The outturn of wheat was good. The potato crop gave very satisfactory results. If its cultivation is continued, the Deputy Commissioner thinks that it will soon become one of the most important crops of the Dooars. Vegetable seeds were distributed gratis, by this Department, with satisfactory results. The vegetables grown were taken and much appreciated by the people, who were, it is reported thoroughly satisfied with the return, and it has been recommended to carry on the distribution of seed for a few years, so that the people of the Dooars may not have to depend on Cooch Behar cultivators for their vegetables.

(3) *Wards' Estates in Rajshahye.*—An important improvement was made in the Burdhankothi estate, in the district of Rungpore, under the managership of

Moulvi Bazlal Haq. In January 1889, the Manager induced 76 families of Sonthals, including 318 persons, to immigrate, into the estate, for the purpose of bringing jungle land under cultivation. Since then there has, during the year under report, been an addition of 10 families with 40 persons, so that now a total of 350 persons have settled in the Sonthal colony in the Ghoraghat jungle. They reclaimed a tract of land and reaped the first harvest of Indian-corn in August last. The crop is reported to have been most successful. A second crop of mustard was grown by the settlers, and they promised to grow sugarcane and jute this year. The headman of these Sonthals has been sent to his own country to induce more families to immigrate, as the area to be reclaimed is very extensive, and at the present rate would take about 25 years before the whole of it could be brought under the plough. Much credit is due to him for the satisfactory results hitherto obtained.

The Sonthals have supplemented the profits derived from cultivation by selling charcoal, and have met the demands in this respect of all the European residents at Rungpore.

In Dinagepore nothing was done during the year in the Maldwar Ward's estates. A scheme, however, has been submitted for the introduction of families of Sonthal settlers into the estate, with a view to bring waste lands under cultivation, and it is now under consideration.

In Chooramon nothing had been done up to the time when the estate was released in June 1889.

In Sunkerpore experiments were made with Buxar wheat and improved ploughs, which were not, it is reported, successful. The Behea sugarcane mill was largely used. Attempts were made to grow English vegetables with fair success, and some nurseries of timber and fruit trees were started. Attention was paid to the excavation of tanks.

In Haripore, English vegetables, such as cabbages and cauliflowers, and the cultivation of mustard, were tried experimentally, and are said to have been successful. Two sugarcane mills and three improved ploughs were tried by the ryots for the first time, and they were, it is said, greatly impressed in favour of the former.

In the Rajshahye district no agricultural experiments or improvements were attempted in the important estate of Dighapattia, which is under the management of the Court of Wards.

(5) Chittagong Division.—*Government Estates.*—The cultivation of potatoes and tobacco was tried for the first time in the Ranzan khas mehals, but without success, as most of the seed was received in a damaged condition. Sugarcane cultivation was also undertaken, and is reported to have done well. Cabbages and other vegetable seeds were tried at Patia, but the result was not satisfactory. Sugarcane was also planted in certain parts of the Satkania khas mehals, where it is said to be flourishing.

Wards' Estates in Chittagong.—Experiments were made by the general manager in the estate of Fazal Ali Khan at Dohahazari, Raygaura, and Katgar with Buxar wheat, barley, tobacco; and potatoes. The wheat and barley did fairly well. Potato seeds were received in a damaged condition, and the outturn was consequently very poor. The tobacco crop, which has been cut and is now under preparation, was grown from Rungpore and Virginia seed. Samples of the produce were sent to this office, and have been forwarded to the Agri-Horticultural Society for appraisement. English vegetable seeds were tried and gave very good results.

6. Burdwan Division.—In Bankoora and Beerbhoom districts no improvements whatever or experiments were made in any estates.

Private Estates.—The proprietors of an indigo factory at Jahawdanga, in the Culna subdivision, tried a European plough drawn by four bullocks, which is reported to have worked better than the native plough. A Hindustani plough was tried at Maingachi in the same subdivision, and is favourably reported on. The Behea sugarcane mills continue to be extensively used by the agricultural classes with profit.

Government Estates.—In the Burdwan district no agricultural improvements or experiments were tried in any of the Government estates. In the Jellamutta and Majnamutta estates of Midnapore, an experiment was made in growing long-stemmed paddy. The seed was obtained from Dacca, but

was received too late for broadcast sowing. It was therefore sown in seed-beds, and the seedlings were planted out in the ordinary way. The crop is reported not to have done well. In the Bhagbanpore Tehsil Circle the experiment was made under the supervision of an officer of this Department, and although the crop had, contrary to the usual practice, to be transplanted like the short-stemmed varieties grown in the country, it was found to have grown very luxuriantly; but for want of rain in the latter part of the season the outturn was not so good as had been expected. Some of the ryots who made experiments in cultivation of long-stemmed paddy are reported to have been well pleased with the results, and preserved seed for cultivation in the present season.

In the Bhagaban Circle an experiment was made in cultivation of potato, which is a crop at present unknown in the Jellamutta and Majnamutta estates. The plants came up very well in all but one or two instances, in which the seed had been spoiled by heavy rain which fell in November, but subsequently they got infected with grubs and white-ants. The outturn obtained by several cultivators averaged 20 maunds per bigha, which, in view of the unfavourable character of the weather and the novelty of the cultivation, may be considered to be fairly satisfactory.

Wards' Estates.—In the Belluria, Khettrohat, Mahespore, and Baruthorhingly estates, the cultivation of long-stemmed paddy of Pubna was tried, but proved unsuccessful. Potato cultivation was introduced with fair success at Malighati, Nayagram, and Beluria. Gram and castor seed were very successful in the Beluria estate. Cabbage was tried at Nayagram, but failed on account of the unsuitability of the soil and delay in sowing.

Buxar wheat was tried without success in the Sarka, Malighati, Nayabasan, and Nayagram estates.

A sum of Rs. 2,887-10-1 was spent in the re-excavation of tanks and in repairs to bunds, grambheries, &c.

(6) CHOTA NAGPORE DIVISION.—*Wards' Estates.*—The only experiments made in the Chota Nagpore Division were undertaken in the Jheria ward's estates in Manbhoom, under the supervision of Mr. B. C. Basu:—

(*a*) *Paddy.*—Manure experiments made on paddy proved that plots manured with bonemeal and oil-cake yielded a larger quantity of grain and straw than the unmanured plots.

(*b*) *Potato.*—Australian and Darjeeling seed-potatoes, which were introduced for the first time, gave a poor outturn; but the quality of the tubers, which were large and plump, made a favourable impression on some *Koeries*, who have undertaken the cultivation of potato this year on their own account.

(*c*) *Sugarcane.*—The effects of bonemeal, oil-cake and superphosphate were tested with the ordinary local canes. In every instance these manures gave better results than cow-dung and ashes. The Mauritius system of planting canes is now under trial. A trained *gur*-maker was brought from Behea to teach the ryots how to make *gur*. The *gur* prepared was much superior to the native *gur*. One of the local growers has learnt the process, and it has been decided to continue the experiment this year.

(*d*) *Ensilage.*—A silo was constructed and filled with wild grasses of all kinds, and opened in the presence of a body of raiyats five and a half months after it had been closed. At first the cattle would not touch the ensilage, but they took to it with avidity when dried. The ensilage was distributed among raiyats of the locality, who took it to their homes, gave it to their cattle, and are said to have reported very favourably on it.

The Collector, Mr. Baker, considers that the results of these experiments are satisfactory, and recommends the continuance of them. Some tanks were turfed and bunds repaired in the Lohardugga, Singbhoom, and Manbhoom estates.

(7) BHAGULPORE DIVISION.—No agricultural improvements or experiments were made in any of the Wards' estates of the districts of this division, except Maldah, and as no grant was made for agricultural improvements in Government estates for the year 1888-90, no new crops or implements of any kind

were introduced into these estates. In the Chanchal Ward's estate potato cultivation was tried in the hope of getting the tenantry to take to this crop, but the result was not satisfactory... Attempts were made to introduce Buxar wheat into the same estate; the outturn was poor, but the quality is reported to have been superior to the country variety.

Works of agricultural improvement, such as the construction of embankments, the re-excavation of tanks, and the sinking of wells, were carried out, the most important of which was the completion of the excavation of a canal in the southern portion of the Chanchal estate, by which a large area has been brought into a culturable condition, thus making a permanent addition to the income of the estate.

(8) PRESIDENCY DIVISION.—*Private estates.*—No improvements or experiments were made.

Government estates.—In the 24-Pergunnahs money was expended, out of the funds allotted for agricultural improvement, in the construction and repairs of embankments and dams. In the way of agricultural experiment nothing was tried beyond the introduction of boro paddy, which is being cultivated with some success as a new crop. The Collector, Mr. Bolton, did not think it necessary or desirable to undertake any agricultural experiments, "as the existing system of agriculture is," in his opinion, "suited to the capa-"bilities of the soil and the tenants, who are opposed to any change." "There is," "he says, "no demand whatever for machinery, and it could not be profitably introduced." Buxar wheat was tried in different estates in Meherpore in the district of Nuddea, but failed, as the heavy rains of the latter end of November destroyed the young plants. In the Murshedabad Government estates the cultivation of Buxar wheat was attended with a fair amount of success. Two iron ploughs were purchased for these estates for experiment during the ensuing season.

Wards' estates.—No agricultural experiments seem to have been made in any of the wards' estates in this division. A sum of Rs. 2,536 was spent in the Cossim Bazar estate in the excavation of two tanks, and Rs. 138 has been sanctioned for erecting a bund in mehal Annudya.

(9) PATNA DIVISION.—No agricultural experiments and improvements of any kind were made in Government, wards' and private estates in the Mozufferpore, Sarun and Chumparun districts during 1889-90.

In Durbhunga the cultivation of Buxar wheat was tried by Raja Rameshwar Singh Bahadoor, who sent seed for cultivation to some of his patwaries and tehsildars. The experiments failed, it is said, through the mismanagement of these officers. The Raja, however, intends to try them again.

In Patna no experiments were made in Government or private estates.

Experimental cultivation of Buxar wheat was carried on in the mehals of Dosut and Birthu, the property of the minor, Babu Bhagawat Narain Singh.

In the former mehal the yield of the country wheat was larger than that of the Buxar variety.

The result of experiments at Birthu was more satisfactory. The combined outturn of grain and straw of the Buxar was greater than of the local variety.

Two improved ploughs (viz, the Seebpore and Cawnpore Baldeo) were supplied by this Department. The former, it is reported, was found well adapted to Kewal soil and suitable for the cattle used, which were found strong enough to pull it.

The latter was found unsuited, both to Kewal and Balsunder soils.

A sum of Rs. 4,600 was spent on repairs to embankments, construction and repairs of wells, construction of bridges and the clearing of water channels.

In the district of Shahabad the cultivation of hill potatoes and English vegetables was tried by the Subdivisional Officer of Sasseram in the Sasseram Government garden, and in the Government estates of Nasrigunge, Babhua, and Deodya. The result of the cultivation of hill potatoes is reported to have been fairly successful, but not sufficiently so to induce the ryots generally to undertake the cultivation of this variety. The reason assigned is that the cultivation is more costly than that of the country variety, which finds more favour among the people. *Spanish gram* was also tried by the Subdivisional Officer of Sasseram, but it failed, because it was sown too late.

No agricultural experiments of any sort were tried in any of the wards' estates in this district.

In private estates experiments were carried on in the Doomraon and Bhojpur experimental farms, an account of which has been given in another portion of this report.

(10) ORISSA DIVISION.—Advantage was taken of the tour of Mr. Banerji, who was engaged in the preparation of an analysis of the Cuttuck district, to introduce red Saharanpur and Shamshara sugarcane cuttings in the Modhupur estate, which is now under the management of the Court of Wards. The cuttings were taken from the Burdwan and Seebpore farms, and a Burdwan *mali* was temporarily engaged to carry on the cultivation. Four plots have been made and sown, and manured, side by side with local cuttings planted by the ryots, without manure. The plants are reported to be doing exceedingly well, proving, it is said, already the benefits of deep cultivation and good manuring.

No other agricultural experiments worthy of notice were made in this division. Dams were constructed for protection of crops in the Government estates of Pooree and Balasore

(11) DACCA DIVISION.—No agricultural experiments or improvements were made in any Government, wards,' or private estates of this division.

127. The following statement shows the expenditure in wards' and Government estates on agricultural experiments, improvements, and other works of the nature of agricultural improvements, during the year, so far as can be ascertained from the Commissioners' reports:—

DIVISION.	In digging tanks and wells.	In draining and irrigation.	In dams and embankments.	In planting trees.	In agricultural experiments properly so called.	In sundry works.	TOTAL.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Dacca	...	...	...	...	...	...	...
Chittagong	...	...	...	...	...	...	...
Rajshahye	60 0 0	...	...	82 5 7	...	735 0 0	877 5 7
Chota Nagpore	...	...	13,414 3 1	...	415 0 0	...	3,829 3 1
Presidency	2,536 0 0	...	2,831 14 2	...	...	100 0 0	5,267 14 2
Bhagulpore	800 0 0	5,496 8 3	2,551 0 0	...	...	225 0 0	9,073 8 3
Burdwan	2,928 8 3	...	597 2 0	...	1,297 7 9	167 5 2	4,990 7 2
Patna	100 0 0	...	4,500 0 0	...	...	...	4,600 0 11
Total ...	6,424 8 3	5,496 8 3	13,694 4 2	82 5 7	1,712 7 9	1,217 5 2	28,637 7 2

128. On the whole it may be said that more interest has been shown in agricultural improvement during the year under report than in previous years, wherever the district officers have shown themselves alive to the importance of the subject; but where they are of the opinion that no improvement is possible, their subordinates have neither done, nor attempted to do, anything in this direction.

129. Only a very small portion of the allotments for miscellaneous improvements and sanitary works was expended in agricultural improvement or experiment properly so called, the expenditure under this head being Rs. 1,712 out of a total allotment, for miscellaneous and sanitary improvements of Rs. 28,637-7-2. The rent of cutcherries and of the land on which they stand, in some cases, and in others the cost of works of protection, such as embankments, which are indispensable for maintenance of the revenue, have been charged to miscellaneous improvements, in apparent contravention of the Board's rules. Such works cannot properly be called improvements, and should be charged to cost of management. The outlay on agricultural experiment and improvement properly so called was, it will be seen, very trifling.

Agricultural Implements.

130. (1) *Ploughs.*—During the year under report Seebpore wrought-iron ploughs were sent to the Commissioner of Patna for trial, one Seebpore and one Baldeo plough to the Sub-Deputy Collector of Banki, one Seebpore wrought-iron and one Barakur cast-iron plough to Mr. Spring at Multan, one Seebpore wrought-iron plough to Mr. Hay Cooper, Azimgarh, and one Seebpore wrought-iron plough to the Director, Department of Land Records and Agriculture, Punjab.

The Commissioner of Patna reports that the Seebpore wrought-iron ploughs sent to him were distributed to the well-to-do ryots of the estate of minor Bhagual Narain Singh of Patna, and that they are well adapted for that part of the country. The cultivators like the ploughs, but whether they will substitute them for their antique implements is, he says, very doubtful. The Sub-Deputy Collector of Banki reports that the Seebpore ploughs are liked by the people, and said to be working tolerably well, but the price is high. A native gentleman of Jessore was supplied with one Seebpore plough, and has been so much pleased with the working of it that he has lately purchased three more for himself and two for his tenants. Mr. J. W. Crowdy, of Durbhunga, reports very favourably on the Seebpore wrought-iron plough. He writes:—

"I find the Seebpore ploughs very useful, especially in light soils. I have now over 40 in use, and the great advantage I find is that they are so light that any bullock who can draw a common plough can work them with the greatest ease, so I have not to keep a large complement of bullocks, as I should have to do if they were heavy and unwieldy."

The Seebpore plough was exhibited at Agricultural Exhibitions, which were held during the year at Murshedabad, Satkhira, and Khulna, and at the Falakata fair in Julpigoree. At the Murshedabad Exhibition it obtained the first prize for ploughs, and at the others it was much praised by the visitors, but the usual objection of heaviness of draught and costliness were urged against its general adoption.

(2) *Water-lifts.*—Twenty-seven Barrakur pumps were disposed of during the year by the Bengal Iron and Steel Company of Barrakur, and two Barrakur pumps were supplied during the year to the Collector of Khulna, who reports that they were used in baling out water, and that in this respect they worked satisfactorily.

(3) *Sugar turbine.*—The centrifugal sugar drier, also called the turbine, was exhibited at the Khulna Exhibition, and an experiment made there in the manufacture of *dolo* sugar by this machine proved successful. The turbine is coming into use for making *dolo* or *kutcha* sugar out of cane *rab* in the district of Shahabad, and it is not improbable that it may be introduced for the same purpose in Central Bengal, where the manufacture of sugar from date-palm juice is an important industry.

(4) *Butter-making machines.*—An interesting series of experiments was made during the year by Mr. Howman, who had been deputed to India by the Dairy Supply Company of London to show the working of the centrifugal cream separator and other dairy machines, with the ultimate view of creating a market for them in India. The experiments were made at the Metcalfe Hall in Calcutta, at the Khulna Exhibition, and at Bankipore. A comparative trial between the English method of butter-making by these machines and the native process resulted in favour of the former; but the trials of the dairy machines were far from being conclusive, and leave it an open question which system, native or European, gives the larger yield of butter. Since Mr. Howman left, Messrs. Basu and Banerjee have made a comparative trial between the European dairy machines and the native churn, and have found that, not only in respect of quantity, but also of quality, the former are preferable. Attempts will be made to bring the dairy machines to notice at mêlas and elsewhere.

Specifications of Invention.

About 29 applications for patents were received during the year under report from the Government of India, Revenue and Agricultural Department, and opinions were expressed upon them.

Agricultural Exhibitions.

131. The exhibitions which have been held during the year were the following:—

1. An agricultural show was held at Falakota in Jalpiguri in January last. The Seebpore plough and other implements were exhibited by this Department.

2. Agricultural exhibitions were held at Khulna and Satkhira in February and March last. In both these exhibitions an assistant of the Department was present, who exhibited several implements, &c.

CHAPTER VI.

Cattle-breeding and Veterinary Establishments.

132. The question of the establishment of a Veterinary College in Bengal was again considered during the year. It came to notice that there has been recently established at Sodepore, in the neighbourhood of Calcutta, a pinjrapole or asylum where 1,300 animals (cows, bullocks, horses, sheep) are fed and medical treatment is given to them. This institution was founded by some native gentlemen, and has been supported by donations from the public, which already amount to three lakhs of rupees. It was suggested that a veterinary school might be established in the same place and worked in connection with the pinjrapole. The committee of management of the pinjrapole accepted the proposal, and undertook to provide a site free of charge for the proposed school and hospital, and to contribute Rs. 30,000 towards the construction of the necessary buildings. The scheme is now under the consideration of Government.

133. The necessity for the establishment of a veterinary school in Bengal and for the provision of trained veterians is shown by the fact that during the year it has been reported that 55,371 head of cattle were attacked by rinderpest, cow-pox, foot-and-mouth and other diseases; that 29,587 died, and that there is not a single officer in these provinces who can be deputed, on occasions of outbreaks of cattle-disease, to give assistance or advice. The number of cases of deaths reported is, as a matter of course, only an insignificant portion of the number of deaths which really occurred.

Sheep-breeding.

134. It was stated in last year's report that merino rams had been supplied to Mr. Abbott of Jaintpore, Mozufferpore, Mr. Peppe of Ranchi, and to Baboo Thakurai Bhagwat Dyal Singh. Mr. Abbott reports that the two rams supplied to him died during the year. Mr. Peppe's experiments, conducted at the Tesil tea estate, were attended with satisfactory results and go to prove that Behar sheep thrive better there than in Behar itself. The sheep seemed to thrive on grass alone, which they found for themselves in the tea gardens without in any way injuring the tea-bushes, and even when there was scarcely a blade of grass to be seen, they did exceedingly well on *mowah* berries and the fresh green leaves of the sál tree. Experiments were made with crossing country ewes with a Merino ram. Samples of the wool of the cross breeds were sent to Mr. Orrah of the Bhagulpore Jail, who declared them to be far superior to the wool of country sheep. Where the country sheep wool would realise Rs. 16 per maund, the cross bred wool would, he says, readily sell for Rs. 35 per maund. It therefore appears advisable to encourage cross-breeding with carefully selected merinos in Chota Nagpore.

CHAPTER VII.

AGRICULTURAL AND FISCAL STATISTICS.

135. Forecasts of the wheat and jute crops were prepared during the year. It has been stated by members of the Chamber of Commerce and by wheat merchants in Calcutta, that they think that these forecasts have as a rule been correct, and that they have been found useful to traders.

In accordance with the orders of the Government of Bengal, statements showing the estimated outturn of the bhadoi, of the winter rice, and of the rabi harvest, and of special crops, such as sugarcane, tobacco, ganja, opium, and others, were prepared during the year.

As noticed in last year's report, a circular was issued to district and divisional officers, and managers of Government and Wards' estates, on the subject of the compilation of agricultural statistics, from examination of actual areas sown under various crops in typical villages in Wards' and Government estates, of which maps have been prepared. Statements have been submitted to the Board of Revenue, containing statistics relating to crop areas, land tenures, and incidence of land revenue for certain districts of Bengal. The statistics for the remaining districts, with few exceptions, have since then been received and are now being compiled and examined in this office, and will soon be submitted.

136. As reported last year, the Department continues to be indebted to the Calcutta Chamber of Commerce for the ready aid afforded by them, and by the Committee of the Wheat and Seed Trades Association in all matters which have been referred to them in connection with the trade or agriculture of the province. The Agri-Horticultural Society has also continued to give valuable assistance on questions on which they have been consulted

TOURS.

137. I visited the following places:—

Cuttack, Balasore and Pooree, in connection with the re-survey and re-settlement of Orissa.

Soory, in Beerbhoom, in connection with the survey and settlement of Hukumapore estate, belonging to Burdwan Raj khas mehals.

Dacca, in connection with the survey and settlement of Government and private estates.

Backergunge, in connection with the survey and settlement of Dakhin Shahbazpore wards' and Government estates.

Tipperah, in connection with the survey and settlement of Serail pergunnah.

Chittagong, in connection with the survey and settlement of Chittagong, Old Thannah Ramoo and Serail, &c.

Burdwan, in connection with the Burdwan Raj khas mehals.

Banki, in connection with the survey and settlement of Banki.

Angul, in connection with the survey and settlement of Angul.

Tikri, in Cuttack, in connection with the survey and settlement of Kujong.

Alipore Dooars, in connection with the survey and settlement of Julpigoree Dooars.

Officers of the Department.

138. Mr. Sen was transferred to the regular line of the Civil Service during the year, very much to the loss of this Department. Mr. Basu was the only officer engaged on purely agricultural duty during the year, and he gave complete satisfaction. Mr. Banerji was appointed to be one of my Assistants in Mr. Sen's place, and promises to be a useful officer. Of the Settlement Officers, Mr. Collin worked with his usual care and ability. The Cirencester graduates employed in settlement work (Messrs. A. K. Raye and D. L. Roy) are favourably reported on. Moonshee Nundji performed the difficult duties entrusted to him with tact and judgment.

I have the honour to be,

SIR,

Your most obedient servant,

M. FINUCANE,

Director of the Department of Land Records and Agriculture, Bengal.

APPENDICES.

APPENDIX A.

Statement showing Principal Government Estates under Survey and Settlement.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
DIVISION.	District.	Name of estate.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed up to 31st March 1889. (In acres.)	Area surveyed during year ending 31st March 1890. (In acres.)	Total cost of survey to end of 1889-90.	Cost of survey per acre.	Total cost of settlement to end of 1889-90.	Cost of settlement per acre approximately.	Increase of revenue or rent obtained or expected.	Average total cost per acre to end of March 1890.	REMARKS.
							Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
Orissa	Cuttack	Angul	563,840	Professional ...	323,827	40,647	1,02,357 0 0	0 4 10	40,363 0 0	0 1 10	74,000 0 0	0 6 8	The increase is to be progressive.
	Cuttack	Banki	76,800	Ditto ...	76,800	.....	24,874 0 0	0 5 1	8,018 0 0	0 1 8	5,000 0 0	0 6 9	
	Pooree	Government estates in pergunnahs Rohang, Serai, and Choubiscood	1,83,040	Ditto ...	.....	229,120	24,872 0 0	0 1 9	2,002 0 0	...	*7,000 0 0	...	* The general survey of Orissa and of Chittagong are not included in this statement.
Rajshahye ...	Julpigori	Western Dooars of Julpigori	1,224,320	Ditto ...	88,639	194,560	1,04,509 0 0	0 9 9	24,755 0 0	...	40,000 0 0	...	
Chittagong ...	Chittagong ...	Old thana Ramoo	156,390	Ditto ...	32,516	35,922	82,490 0 0	0 6 11	†1,495 0 0	...	15,000 0 0	...	† Exclusive of Assistant Settlement Officer's pay, &c.
		Thanas Satkania, Banskhali, and Patiya	443,520	Ditto ...	.....	128,000							
	Tipperah	Group of Government estates named in Appendix C.	7,808	Ditto ...	5,722	1,491	.....	...	...	...	...	...	
	Noakhally ...	Chur Peer Buksh	5,088	Non-professional	.....	.....	.....	...	...	...	300 0 0	...	
Dacca	Backerganj ...	Group of Government estates named in Appendix C.	77,211	Partly professional and partly non-professional.	.....	29,440	Not known	...	...	...	12,655 0 0	...	
Presidency ...	Nuddea	Group of Government estates named in Appendix C.	2,083	Non-professional	.....	.....	.....	...	...	...	...	...	
Burdwan ...	Midnapore ...	Group of Government estates named in Appendix C.	7,524	Ditto ...	7,524	.....	2,644 0 0	0 10 0	1,261 0 0	0 1 9	...	0 11 9	
Patna	Shahabad ...	Dhanchuhan	1,075	Ditto ...	.....	1,075	96 12 0	0 1 5	...	...	313 0 0	...	

Statement showing Wards' Estates under Survey and Settlement in 1889-90.

							Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
Orissa	Cuttack	Kujang	235,258	Professional ...	69,120	166,138	48,582 0 0	0 3 6	5,820 0 0	...	...	...	
		Kanika	288,000	Ditto ...	167,040	115,849	32,652 0 0	0 4 6	837 0 0	0 0 2	15,000 0 0	0 0 8	
Rajshahye ...	Dinagepore ...	Sunkerpore	210,560	Ditto ...	208,141	2,419	89,611 0 0	0 6 9	36,291 0 0	0 3 0	15,588 0 0	0 9 9	
		Churaman	55,134	Non-professional	20,206 0 0		0 5 10	13,397 0 0	0 3 10	141 0 0	0 8 8		
		Maldwar	98,150	Professional ...	98,150	.....	35,900 0 0	0 5 8	19,350 0 0	0 2 9	4,508 0 0	0 8 5	Since the close of the year the final report has been received, and shows the total outlay has been Rs. 59,390.
Burdwan ...	Burdwan	Burdwan Khas Mehals ...	247,040	Ditto ...	23,040	183,040	76,345 0 0	0 6 9	...	...	...	...	
	Bankoora												
	Birbhoom												
	Midnapore ...												
	Hooghly ...												
Presidency ...	Nuddea												
Burdwan ...	Bankoora												
	Birbhoom												
	Midnapore ...												
	Hooghly												
	Burdwan	Srinagar-Baneili	444,800	Ditto ...	444,800	.....	1,33,500 0 0	0 4 10	96,500 0 0	0 3 3	21,842 0 0	0 8 2	
Bhagalpore ...	Bhagalpore ...												
	Purneah												
	Maldah												
	Monghyr												
Chittagong ...	Tipperah	Serail Pergunnah	195,200	Ditto ...	.....	165,760	35,252 0 0	0 3 4	...	...	...	...	
Dacca	Backerganj ...	Dakhin Shabazpore	61,440	Ditto ...	.....	.....	.....	...	...	...	...	...	

Statement showing principal Private Estates under Survey and Settlement in 1889-90.

							Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
Rajshahye ...	Rajshahye ...	Dubalhati, including Barbakpore, etc.	41,992	Non-professional	40,272	1,720	9,316 0 0	0 3 6	17,214 0 0	0 6 6	25%	0 10 0	
Burdwan ...	Birbhoom ...	Mehal Mollarpore	23,320	Ditto ...	.....	10,550	2,469 0 0	0 3 9	...	...	...	...	
Burdwan, Presidency, Dacca and Chittagong.	Midnapore, Birbhoom, Burdwan, Bankoora, Nuddea, Mymensing, and Tipperah.	Group of private estates in Appendix C.	13,438	Ditto ...	9,307	2,958	7,161 0 0	...	3,290 0 0	...	1,553 0 0	...	

APPENDIX B.

Statement showing progress made in record of rights and settlement of rents to the end of the year 1889-90.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
						Classification of Tenants.												
Name of Estate.	Number of villages.	Total area of the estate in square miles.	Area of which survey records were made over to the Settlement Officer.	Number of raiyats in the estate.	Total number of raiyats whose rents had been recorded and status determined.	Number of cultivating tenure-holders and under-tenure-holders.	Area cultivated by them.	Number of raiyats at fixed rates.	Area held by them.	Number of settled raiyats.	Area held by them.	Number of occupancy raiyats, but not settled raiyats.	Area held by them.	Number of non-occupancy raiyats.	Area held by them.	Number of under-raiyats.	Area held by them.	Remarks.
Government estates.																		
Angul	628	638·46	538	20,876	4,963	576	1,388·14	...	.....	2,251	109,793·22	45	28·22	4	2·66	2,087	2,592·39	
Banki	144	120	120	23,453	4,425	553	588·80	...	.....	.....	.....	1,390	3,066·29	2,113	2,545·54	369	26·51	
Jalpaiguri Doars	Not known.	1,913	185	... ...	.....	.....	(Not known. Tenure-holders' under-tenants are principally adhiars who pay rent in kind.)											
Old Thana Ramoo	47	245	48·8	14,812*	4,951	132	1,914	...	.....	3,171	11,253	131	602	226	726	1,291	1,695	
Chittagong	23	602	.....	5,042*	2,315	978	627·55	562	658·92	403	392·88	5	7·87	181	114·41	186	89·13	
Pergunnah Singergaon ...	77	5·8	5·8	765*	765	.....	.....	...	.....	765	3,632	...	.....	.....	.....	.....	.....	
Pooree—																		
Pergunnah Rohang ...																		
,, Serai ...	40	.....	6	2,050*	634	77	376·32	...	.....	508	616·72	2	0·11	34	31·88	13	18	
,, Chowbiskud																		
Bhetia	23	10·6	10·6	1,275	1,275	14	.....	21	.....	421	.....	340	.....	1	.....	478	.....	
Wards' estates.																		
Kanika	11	447	16	313*	109	.....	.....	...	.....	109	332	...	.....	.....	.....	.....	.....	
Sunkerpore	868	325·2	305·53	37,297	28,596	2,041	13,072	12	84	12,868	72,902	42	279	8,239	23,580	4,794	7,178	
Maldwar	278	189	153	11,900	22,950	300	1,750	690	4,330	11,080	74,250	411	2,640	1,587	6,468	8,932	9,068	
Chooramun	191	86·5	86·5	10,481	10,481	116	2,673	12	152	6,820	28,195	66	376	2,514	6,652	1,744	1,723	
Burdwan Raj khas mehals	163	Not known.	89	9,777	1,330	.....	.....	34	832·7	971	4,122·6	33	231	30	71	262	336·2	
Srinagar Bancili	650	695	695	77,899	72,276	192	.....	172	.....	54,436	.....	896	.....	5,459	.....	11,121	.....	
Serai Pergunnah	.....	305	.....	.....	.....	.....	.....	...	.....	.....	.....	...	.....	.....	.....	.....	.....	
Private estates.																		
Dubalhati	203	65·5	63·5	20,514	16,577	25	.....	...	.....	9,715	.....	2	.....	556	.....	6,279	.....	
Total ...	.....	.....	.....	.....	171,647	5,604	.....	1,503	.....	102,727	.....	3,363	.....	20,894	.....	37,556	.....	
Percentage of raiyats of each class on the total number of raiyats in column 6	.....	.....	.....	.....	.....	3	.....	1	.....	62	.....	2	.....	12	.....	22	.....	

* These are the total numbers of raiyats of the villages mentioned in column 2, *i.e.* in villages of which the survey records are completed.

APPENDIX C

APPENDIX C.

A.—*Statement showing Petty Government Estates under Survey and Settlement in* 1889-90.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Division.	District.	Name of estate.	Area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed up to 31st March 1889. (In acres.)	Area surveyed during year ending 31st March 1890. (In acres.)	Cost of survey to end of 1889-90.	Cost of survey per acre.	Cost of settlement to end of 1889-90.	Cost of settlement per acre.	Increase of revenue or rent expected.	Average total cost per acre to end of March 1890.	Remarks.
							Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
		Jowar Joymangal	1,200	Non-professional	.....	1,200	221 0 0	0 2 11	94 0 0	0 1 3	...	0 4 2	*Note.*—The areas shown in column 4 are only approximate.
		Chur Budna	233										
		,, Chandrisl	665										
		,, Shambhupura	2,559										
		,, Golakpura	2,022										
		,, Pudma	1,930										
		,, Kalachand	1,063	Ditto ...	.....	20,582	2,773 0 0	0 7 0	Not known.			0 7 0	
		Taluq Biswanath Takurta ...	19										
		Chur Joynagur	8,396										
		,, Lamchipata	1,300										
		,, Sitaram	716										
		,, Jangla	422										
		Total ...	19,324										
		Chur Umed	2,598										
		,, Bhoirub	218										
Dacca	Backergunge ...	,, Price	Not measured.										
		,, Lálmohan	11,775										
		,, Lord Hardinge	591										
		,, Krishna Prosad	21,915										
		,, Koralmara	1,694										
		,, Contiguous to chur Koralmara.	545	Professional ...	.....	29,440	Not known.	.....		Not known.		.....	Cost of survey of these and Wards Dhakhin Shahbazpore estate not separately kn as yet.
		,, Kalee	970										
		,, Udoy Kalee	629										
		,, Drummond	3,174										
		,, Goneshpore	1,993										
		,, Bairagia	4,164										
		,, Madhupura	2,079										
		,, Bhusanlatka Madanpara	156										
		,, Fasson	Not measured.										
		,, Lukbi	2,386										
		Total ...	57,887										
		Grand Total ...	77,211	.....	.....	201,702	49,787 0 0	0 5 7	...	...	...	0 5 7	
Burdwan ...	Midnapore ...	Bhetia	6,785	Non-professional	6,785	.....	1,925 0 0	0 4 6	1,235 0 0	0 2 11	1,198 0 0	0 7 5	
		Kamina Chak	739		739	.....	719 0 0	0 15 7	26 0 0	0 0 7	...	1 0 2	
		Total ...	7,524	.....	7,524	.....	2,644 0 0	...	1,261 0 0	...	...	...	
Presidency ...	Nuddea ...	Khosalpore	425	Non-professional	.....	.....	.....	...	...	...	100 0 0	...	Notification published on 17th February 1890. No progress reported.
		Chur Hanspookaria	2,334		.....	2,067	20 0 0	0 0 2	...	...	...	...	
		,, Goalgram	1,501		.....	.....	.....	...	...	...	...	...	
		Total ...	2,083			2,067	20 0 0	0 0 2	...	...	100 0 0	...	

Chittagong ...	Tippersh	Pargana Singergaon	3,757	Ditto ...	2,266	1,491	2,554 0 0	0 10 10	587 0 0	0 2 6	2,448 0 0	0 13 4	Notified, 11th March 1890.
		Nabipore Hosantola	689		689	.....	204 0 0	0 4 8	...	...	261 0 0	0 4 8	
		Maizurdi	595		.....	.....	.....	...	...	...	...	...	
		Jowar Baluakandi	2,767		2,767	.....	1,447 0 0	0 8 4	...	...	1,387 0 0	0 8 4	
		Total ...	7,808	.....	5,722	1,491	4,195 0 0	...	587 0 0	...	4,096 0 0	...	
	Noakhally ...	Chur Peer Bux	5,088	Non-professional	.....	5,088	478 0 0	0 1 6	...	...	300 0 0	0 1 6	
Patna	Shahabad	Dhanchuhan	1,075	Ditto ...	.....	1,075	96 12 0	0 1 5	...	...	313 0 0	...	

A.—*Statement showing Petty Private Estates under Survey and Settlement in* 1889-90.

							Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
Burdwan ...	Midnapore ...	Kesiari	5,255	Non-professional	5,255	.....	3,146 0 0	0 9 7	2,061 0 0	0 6 3	...	0 15 10	Results reported to civil court.
		Bachua estate in Bogri ...	593½		593½	.....	462 0 0	0 12 5	536 0 0	0 14 6	388 0 0	1 10 11	
		Khari Kasuli estate in Bogri...	219		219	.....	162 0 0	0 11 10	79 0 0	0 5 9	117 0 0	1 1 7	
		Gur Purusuttampur	537		537	.....	563 0 0	1 0 9	...	...	288 0 0	1 0 9	
		Purbapitpur	881		881	.....	223 0 0	0 4 0	475 0 0	0 3 7	556 0 0	0 12 7	
		Kodalia	218		.....	218	136 0 0	0 9 11	75 0 0	0 5 6	204 0 0	0 15 5	
		Kripanandpur	277		.....	277	168 0 0	0 9 8	64 0 0	0 3 9	Nil.	0 13 5	
		Gur Moyna	412		.....	412	17 0 0	0 0 8	...	...	...	...	
		Dakin Moyna	472		.....	472	12 0 0	0 0 5	...	...	...	...	
		Rajnagore	554		554	.....	398 0 0	0 11 6	...	...	8 0 0	0 11 6	
		Mehal Uttampore	548½		.....	.....	.....	...	...	...	...	...	No progress reported. Proceedings sanctioned by Commissioner under section 103 and rule 46 of the Tenancy Act rules, on 6th February 1890.
		Mehal Sudampore	142½		.....	.....	.....	...	...	...	...	...	Ditto on 22nd January 1890.
		Mouza Gur Safat	274		.....	.....	.....	...	...	...	...	...	Ditto on 24th ditto.
		Mehal Chowra Chuck	195		.....	.....	.....	...	...	...	...	...	Ditto on 23rd ditto.
		Total ...	10,022½	.....	7,939	1,379	5,286 0 0	...	3,290 0 0	...	1,553 0 0	...	
	Beerbhoom ...	Dharamahatty	112		.....	55	157 0 0	1 13 8	...	...	...	...	Proceedings suspended by order of Commissioner.
	Burdwan and Bankura.	Lot Jagdishpore, estate Chanduti.	104		104	.....	.....	...	...	...	...	...	Commissioner's order to settle rents cancelled on the dispute being amicably settled.
Presidency ...	Nuddea	Mauza Mritikerpara	1,701	Non-professional	.....	1,524	861 0 0	0 9 0	...	...	...	...	Settlement Officer appointed, 22nd April 1890.
Dacca ...	Mymensing ...	Talook Radha Kanai	236		.....	.....	.....	...	...	...	...	...	Case struck off in default of parties to deposit cost.
Chittagong ...	Tipperah ...	Alakdia Durgapur	1,264		1,264	.....	857 0 0	0 10 10	...	...	...	...	
		Total ...	3,416		1,368	1,579	1,875 0 0	...	...	...	...	...	
		GRAND TOTAL ...	13,438		9,307	2,958	7,161 0 0	...	3,290 0 0	...	1,553 0 0	...	

APPENDIX D.

Statement showing increase of revenue obtained or expected in Government Estates and temporarily-settled tracts.

	Increase of Revenue.		Total estimated outlay from commencement to completion of work.	
	Actually obtained.	Expected.		
	Rs.	Rs.	Rs.	
Angul	37,000 for 5 years.	55,000 for next following 5 years. then 74,000.	1,50,000	
Banki	1,170	5,000	36,000	
Orissa	...	7,00,000	15,00,000	
Western Doers, Jalpaiguri ...	...	40,000	3,50,000	The sanctioned estimate for this work is Rs. 2,64,356. The Survey Department now say that their estimate will be exceeded.
Chittagong district, Sadar subdivision ...	...	1,50,000	4,50,000	
Old Thana Ramoo	4,250	15,000	87,804	
Backergunge Government estates ...	...	12,655	20.000	
Government estates in Midnapore ...	1,198	...	3,236	
Ditto in Noakhally ...	...	200	478	
Ditto in Tipperah ...	...	...	...	
Ditto in Singergaon ...	2,448	...	3,141	
Ditto in Baluakandi ...	1,386	...	1,447	
Ditto in Nabipore, Hasantola	260	...	204	
Ditto in Shahabad ...	313	313	970	
Total ...	53,680	9,86,130	26,03,280	

Statement showing increase of rent in Wards' Estates, the settlement of which has been completed or is approaching completion.

	Rs.	Rs.	Rs.	
Srinagar-Baneili estate	21,842	...	2,46,000	The increase in rental is nearly 10 per cent. on the total outlay.
Sunkerpore	15,588	...	1,32,000	
Maldwar	4,508	...	59,390	
Chooramun	141	...	33,603	
Total ...	42,079	...	4,70,993	

APPENDIX E.

Statement showing the comparative merits of different manures applied to paddy plots in the Dumraon Farm.

Broadcasted paddy.

Plots.	Treatment.	Quantity of manure per acre.	Cost of manure per acre.	Outturn per acre.		Value of the produce.	Expenditure per acre.	Net profit.	Net loss.
				Grain.	Straw.				
		Mds. s. c.	Rs. a. p.	Mds. s.	Mds. s.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
3	Lime	9 3 0	3 3 5	9 39	17 15	24 2 1	20 15 3	3 2 10	.....
4	Unmanured	.....	.....	11 13	13 24	24 8 3	17 11 10	6 12 5	.....
5	Cowdung	181 20 0	8 11 2	12 22	25 28	32 2 9	26 7 0	5 11 9	.....
6	Linseed cake	3 1 0	6 12 10	9 33	16 37	23 11 0	24 8 8	.....	13 8 0
7	Cowdung	181 20 0	11 14 7	13 16	22 15	30 5 10	29 10 5	0 11 5	.....
	Lime	9 3 0							
8	Crude saltpetre	3 1 0	13 11 9	16 19	29 7	40 1 5	31 7 7	8 9 10	.....
	Lime	9 3 0							
9	Sweepings	181 20 0	4 14 7	12 34	29 1	34 3 6	22 10 5	11 9 1	.....
10	Crude saltpetre	3 1 0	10 8 4	19 38	27 9	44 11 5	28 4 2	16 7 3	.....
11	Sweepings	181 20 0	8 2 0	9 15	20 16	24 9 7	25 13 11	.....	1 4 4
	Lime	9 3 0							
12	Crude saltpetre	3 1 0	17 5 2	7 10	20 9	21 1 10	35 1 0	.....	13 15 2
	Linseed cake	3 1 0							

APPENDIX F.

Transplanted paddy.

13	Green manured with indigo ...	0 6 0	1 2 0	10 5	21 7	26 2 7	30 4 5	.....	4 1 10
14	Ditto ditto hemp ...	0 21 0	0 10 6	9 27	17 15	23 10 5	26 8 11	.....	2 14 6
15	Crude saltpetre	3 1 0	10 8 4	12 34	18 6	29 1 7	20 6 9	8 10 10	.....
16	Linseed cake	3 1 0	6 12 10	12 10	22 27	30 4 4	20 14 3	9 6 1	.....
17	No manure	.....	.....	8 24	11 25	19 3 8	19 12 1	.....	0 8 5

APPENDIX G.

Statement showing the comparative results of different manures applied to wheat in the Doomraon Farm.

Plots.	Kind of wheat sown.	Manures.	Quantity of manure per acre.	Cost of manure per acre.	Outturn per acre. Grain.	Outturn per acre. Straw.	Value of the outturn per acre.	Expenditure per acre.	Net profit or loss. Profit.	Net profit or loss. Loss.	Weight of wheat per basket.
			Mds. s.	Rs. A. P.	Mds. s.	Mds. s.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	lbs.
24	Muzaffar Nagar	Green manured with hemp.	...	4 1 0	7 16	13 24	26 10 9	27 6 7	...	3 12 7	65
25		No manure	...	...	9 39	16 25	31 4 6	23 5 7	7 14 11	...	64½
27		Ashes	181 20	4 14 8	14 20	22 39	45 1 2	28 4 8	16 12 6	...	...
28		Do.	181 20	8 1 7	9 39	12 10	29 13 0	31 7 2	...	1 10 2	64½
		Lime	9 3								
29	Local white ...	Ashes	181 20	16 7 2	15 17	21 7	46 13 9	39 12 9	7 1 0	...	65
		Crude saltpetre ...	3 1								
30		No manure	...	...	9 21	16 19	30 1 3	23 5 7	6 11 8	...	64½
31	Muzaffar Nagar	Crude saltpetre ...	3 1	11 10 0	10 23	16 5	32 10 7	34 2 6	...	1 7 11	65
32	Local white ...	Cowdung	181 20	8 11 2	16 37	24 2	51 11 1	32 0 9	19 10 4	...	64½
33		Ditto	181 20	11 14 1	12 16	18 12	38 1 6	35 3 8	2 13 10	...	63½
		Lime	9 3								
34		Bonemeal	3 1	6 3 3	4 39	7 4	15 3 2	29 8 8	...	14 5 6	65½
35		Bones	3 1	9 6 2	4 3	6 32	12 12 6	32 11 9	...	19 15 3	65½
		Lime	9 3								
36	Buxar ...	Crude saltpetre ...	3 1	11 10 0	15 32	25 13	49 3 4	34 2 6	15 0 10	...	64½
37		No manure	...	...	11 4	15 2	33 10 7	22 8 6	11 2 1	...	...
40	Muzaffar Nagar	Lime	9 3	3 4 5	12 4	18 18	37 6 1	29 4 4	12 1 9	...	64
41		Do.	9 3	14 15 11	18 8	35 15	58 12 9	36 15 10	21 12 11	...	65
		Crude saltpetre ...	3 1								
42	Buxar ...	Lime alone	9 3	3 4 5	12 4	21 17	38 5 10	25 4 4	13 1 6	...	64½
43		Lime	9 3	14 15 11	16 1	30 10	51 6 11	36 15 10	14 7 1	...	65
		Crude saltpetre ...	3 1								
44	Local red ...	Lime	9 3	14 15 11	15 29	32 14	48 14 2	36 11 10	12 2 4	...	...
		Crude saltpetre ...	3 1								
45		Lime alone ...	9 3	3 4 5	12 28	23 11	38 8 7	25 0 4	13 8 3	...	64½

APPENDIX H.

Statement showing results of application of various manures in the Burdwan Experimental Farm.

Paddy.

Field number.	Area in cottahs.	Quantity of manure applied per bigha.	Actual outturn. Weight of paddy.	Actual outturn. Weight of straw.	Outturn per bigha. Weight of paddy.	Outturn per bigha. Weight of straw.	Cost per bigha. Price of manure.	Cost per bigha. Cost of cultivation.	Cost per bigha. Total.	Price of the outturn per bigha.	Loss or gain per bigha.
			M. s. c.	M. s. c.	M. s. c.	M. s. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
					Aus paddy followed by gram.						
2	6	No manure	1 15 0	2 20 0	4 23 5	8 13 0	...	6 0 6	6 0 6	8 5 0	+ (2 4 6)
3	8½	Bonemeal, one maund ...	2 15 0	3 33 0	5 0 0	9 0 0	2 0 0	6 1 0	8 1 0	9 3 0	+ (1 2 0)
4	5½	No manure	1 15 0	2 16 0	5 0 0	8 29 0	...	5 15 9	5 15 9	8 12 0	+ (2 13 3)
					Aus paddy followed by wheat.						
5	10	No manure	1 20 0	3 0 0	3 0 0	6 0 0	...	5 14 0	5 14 0	5 11 0	— (0 3 0)
6	10	Bonemeal, one maund ...	2 20 0	4 0 0	5 0 0	8 0 0	2 0 0	6 10 6	8 10 6	8 14 0	+ (0 3 6)
7	7	No manure	1 25 0	2 20 0	4 25 11	7 5 0	...	6 8 3	6 8 3	7 12 9	+ (1 4 6)
8	10	Ditto	1 19 0	3 20 0	2 38 0	7 0 0	...	5 6 6	5 6 6	6 0 0	+ (0 9 6)
9	10	Saltpetre, 10 seers	1 39 0	5 3 8	3 38 0	10 7 0	2 8 0	5 6 6	7 14 6	8 4 6	+ (0 6 0)
10	6	No manure, ...	1 37 0	2 36 0	6 16 10	9 26 0	...	5 6 6	5 6 6	10 5 0	+ (4 14 6)
					Aus paddy followed by potatoes.						
11	6½	Bonemeal, one maund ...	2 5 0	4 10 0	6 21 8	13 3 0	2 0 0	7 15 6	9 15 6	12 13 3	+ (2 13 9)
					Aus paddy followed by peas.						
64	12½	Cowdung, 150 baskets ...	4 0 0	6 24 0	6 23 14	10 35 0	2 5 0	6 15 0	9 4 0	10 10 6	+ (1 6 6)
65	13½	No manure	3 25 0	5 20 0	5 14 13	8 5 0	...	6 5 0	6 5 0	9 8 6	+ (3 3 6)
66	13	Castor cake, 2 maunds ...	3 30 0	5 0 0	5 30 12	7 27 0	2 11 0	5 2 3	7 13 3	9 11 0	+ (1 13 9)
					Aus paddy followed by lentils.						
67	12½	Bonemeal, one maund ...	3 5 0	6 18 0	4 36 1	10 4 0	2 0 0	5 2 3	7 2 3	9 5 3	+ (2 2 0)
68	14	No manure	2 24 0	5 20 0	3 28 9	7 34 0	...	5 2 3	5 2 3	6 3 9	+ (1 1 6)
69	15	Castor cake, two maunds ...	2 35 0	6 0 0	3 33 5	8 0 0	2 11 0	5 2 3	7 13 3	6 8 9	— (1 4 6)
70	14	Bonemeal, one maund ...	2 39 0	4 36 0	4 10 0	7 0 0	2 0 0	5 2 3	7 2 3	7 6 0	+ (0 3 9)
71	15	No manure	2 25 0	3 30 9	3 20 0	5 0 0	...	5 2 3	5 2 3	6 0 0	+ (0 13 9)
72	16	Bonemeal, one maund ...	3 8 0	4 0 0	4 0 0	5 0 0	2 14 0	5 2 3	8 0 3	6 7 3	— (1 9 0)
		Saltpetre, 10 seers ...									

APPENDIX I.

Jute.

Field number.	Area in cottahs.	Manures applied per bigha.	Actual outturn. Plants.	Actual outturn. Fibre.	Outturn per bigha. Plants.	Outturn per bigha. Fibre.	Cost per bigha. Cost of manure.	Cost per bigha. Cost of cultivation.	Cost per bigha. Total.	Price of the outturn per bigha.	Loss or gain per bigha.
			M. s. c.	M. s. c.	M. s. c.	M. s. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
55	9½	Castor cake, two maunds ...	35 20 0	2 20 0	77 32 5	5 19 0	2 10 6	13 8 0	16 2 6	27 6 0	+ (11 3 6)
56B	6½	Cowdung, 150 baskets ...	42 0 0	3 0 0	134 16 0	9 24 0	3 5 6	17 14 0	20 3 6	48 6 0	+ (27 12 6)
56C	2½	Super, 20 seers	9 0 0	0 25 0	72 0 0	5 0 0	2 2 0	13 8 0	10 0	25 0 0	+ (9 6 0)
		Saltpetre, 10 seers									
56A	4½	Unmanured	16 5 0	1 5 0	71 26 9	5 0 0	...	12 12 0	12 12 0	25 0 0	+ (12 4 0)

APPENDIX J.

I.—Fresh-planted sugarcane.

Field number.	Area in cottahs.	Manures applied per bigha.	Actual outturn. Weight of canes.	Actual outturn. Weight of juice.	Actual outturn. Weight of *gur*.	Outturn per bigha. Weight of canes.	Outturn per bigha. Weight of juice.	Outturn per bigha. Weight of *gur*.	Cost per bigha. Price of manure.	Cost per bigha. Cost of cultivation.	Cost per bigha. Total.	Price of outturn per bigha.	Loss or gain per bigha.
			M. s. c.	M. s. c.	M. s. c.	M. s. c.	M. s. c.	M. s. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
						Khari.							
14	5	Superphosphate of lime 2 8 0	21 30 0	12 0 0	3 0 0	87 0 0	48 0 0	12 0 0	8 2 0	38 5 0	46 7 0	60 0 0	+(13 9 0)
		Saltpetre 0 30 0											
15	5	Mustard-cake ... 5 0 0	33 5 0	14 21 0	3 28 0	132 20 0	58 4 0	14 32 0	12 8 0	42 3 0	54 11 0	74 0 0	+(19 5 0)
		Castor cake ... 5 0 0											
						Shamshara.							
16	5	Superphosphate of lime 2 8 0	13 10 0	7 36 0	1 39 0	53 0 0	31 24 0	7 36 0	8 2 0	29 6 0	37 2 0	39 8 0	+(2 6 0)
		Saltpetre 0 30 0											
17	5	Mustard cake ... 5 0 0	17 32 0	9 0 0	2 8 0	71 8 0	36 0 0	8 32 0	12 8 0	29 10 0	42 2 0	44 0 0	+(1 14)
		Castor cake ... 5 0 0											
18	5	Superphosphate of lime 2 8 0	22 12 0	11 16 0	2 22 0	89 8 0	45 24 0	10 8 0	8 2 0	29 0 0	37 2 0	51 0 0	+(13 14)
		Saltpetre 0 30 0											
19	5	Bonemeal 3 0 0	15 22 0	8 14 0	2 5 0	62 8 0	33 16 0	8 20 0	8 10 0	31 1 0	39 11 0	42 8 0	+(2 13 0)
		Saltpetre 0 30 0											
20	5	Bone powder ... 0 20 0	19 27 0	9 10 0	2 11 0	78 28 0	37 0 0	9 4 0	6 3 6	32 4 0	38 7 6	45 8 0	+(7 0 6)
		Saltpetre 0 30 0											
21	5	Castor cake ... 10 0 0	43 0 0	22 0 0	4 24 8	172 0 0	88 0 0	18 8 0	12 8 0	35 15 0	48 7 0	91 0 0	+(42 9 0)
22	5	Ditto 10 0 0	27 30 0	14 16 0	2 24 0	111 0 0	57 24 0	10 16 0	12 8 0	28 5 0	40 13 0	52 0 0	+(11 3 0)

APPENDIX K.

II.—Ratooned sugarcane.

							Khari.							
	2½	Cowdung ... 200 baskets	49 20 0	23 11 0	3 38 11	396 0 0	186 8 0	31 29 8	3 0 0	47 0 0	50 0 0	158 11 0	+(108 11 6)	
							Shamshara.							
39	5	Castor cake ... 14 0 0	40 5 0	25 4 0	4 3 6	160 20 0	100 16 0	16 13 8	18 10 0	30 1 0	48 14 0	80 11 0	+ (31 13 0)	
40	5	Ditto ... 7 24 0	38 34 0	23 39 0	4 0 11	155 16 0	95 36 0	16 2 12	18 2 6	30 1 0	48 3 6	80 4 0	+ (32 0 6)	
		Bonemeal 4 16 0												
41	5	Ditto ... 8 0 0	21 5 0	12 24 0	2 11 3	84 20 0	50 16 0	9 4 12	16 0 0	23 0 0	39 0 0	45 9 0	+ (6 9 0)	
42	5	Unmanured	5 20 0	3 20 0	0 32 0	22 0 0	13 0 0	3 8 0	...	18 2 0	18 2 0	16 0 0	— (*2 2 0)	

APPENDIX L.

Results of ryots' experiments with bone-meal.

Number of experiments.	Outturn of plot manured with bone-meal at the rate of 240 lbs. per acre.	Outturn of unmanured plot.
	lb	lb
1	1,710	1,140
2	1,680	1,215
3	1,740	960
4	1,740	1,200
5	1,710	1,200
6	1,530	1,080
7	1,800	960
8	1,680	1,050
9	1,692	1,200
10	1,560	1,148
Average ...	1,684·2	1,114·5

APPENDIX M.

Results of the experiments in the Jheria Ward's Estate with bone-meal and castor-cake as manure for paddy.

In three parts of the same field the results were—

	Of grain. Mds.	Of straw. Mds.	Remarks.
No manure, as usual in the country, gave ...	12·5	26·5	With regard to the last three fields, the ryots who owned them picked out the best among the three, and kept it without manure, otherwise the superiority of the manures applied would have appeared still greater.
One maund of bone-meal per bigah ...	17·5	33·7	
One and-a-half maunds of oilcake per bigah ...	15·7	33·7	
In two other adjoining fields—			
One unmanured	8·6	18·6	
The other manured with one maund of bone-meal ...	13·0	27·4	
In another set of fields, the results were—			
No manure	11·2	24·4	
Bone-meal one maund per bigah	15·4	30·8	
Oilcake one and-a-half maunds per bigah ...	14·0	29·7	

APPENDIX N.

Results of experiments with bone-meal as a manure for paddy in the Burdwan and Seebpore farms. The following results were recorded in 1886-87 in the Burdwan farm:—

Number of experiments.	Outturn of paddy per acre in plot manured with bone-meal.	Outturn of paddy per acre in unmanured plot.
	lb	lb
1	2,631	1,191
2	1,172	660
3	1,668	1,302
Average ...	1,824	1,051

H. P. and others.—Reg. No. 1703J—994—1·8·90.

REVENUE DEPARTMENT.

AGRICULTURE.

CALCUTTA, THE 23RD SEPTEMBER, 1890.

RESOLUTION.

READ—

Letter No. 630A, dated the 13th August, 1890, from the Board of Revenue, Lower Provinces, submitting with their remarks the annual report of the Director of the Department of Land Records and Agriculture, Bengal, for the official year 1889-90.

THE Director was chiefly employed during the year on important settlement work, and, in so far as it relates to this Department, and to the supervision he has exercised over improvements on Government and Wards' estates, his valuable report will be reviewed with those submitted by the Board of Revenue as to Land Revenue Administration and the management of estates under the Court of Wards. He, however, found time to prosecute with effect the agricultural enquiries which form the second part of his duties, completing, with the aid of Mr. B. C. Basu and Mr. N. N. Banerjee, the analysis, as it has been called, of the districts of Dacca and Lohardugga, and making interesting investigations as to forest and fuel reserves, tree-planting and other subjects of a kindred nature.

'Eradication of *pebrine* and silk experiments.

The work originally undertaken by Government at Berhampore for the eradication of *pebrine* among silk-worms, by the supply of untainted seed, was carried on during the year under the supervision of a committee of merchants interested in the trade, with Sir Alexander Wilson as President. There appears to be no doubt that the action taken has been judicious, and may ultimately result in reducing very largely the loss suffered from the disease; but last year the success obtained was not as great as had been expected. Of 7,295 maunds of seed raised, only 1,358 maunds were sold—a result which indicates no particular eagerness on the part of the villagers to obtain the improved production. Some experiments undertaken in Midnapore on a small scale were more successful. The sum of Rs. 5,000 a year is contributed by Government towards these experiments, and the services of Mr. Mookerjee, Probationary Deputy Collector, who has studied the subject in Europe, have been lent for the purpose. The Lieutenant-Governor hopes that the work will be continued steadily for a series of years, as from its nature no great improvement can be expected to result at once, while perseverance will probably result in success, such as has been obtained by similar methods in other countries.

Experimental farms.

A series of experiments were tried at the Dumraon, Burdwan, and Seebpore farms during the year. In regard to the fodder grasses tried at Burdwan, the Director observes:—

"From the statement given below it will be seen that bone-meal, applied at the rate of one maund per bigha, gave excellent results with *sorghum*, raising the outturn to more than twice that of an unmanured plot:—

Manure applied per bigha.	Outturn per bigha.	
	MDS.	S.
Bone-meal, per maund	280	36
Unmanured	118	0

This experiment further showed that *sorghum* succeeds as a rainy weather crop where it had been found to fail as a cold weather crop. In the absence of any demand for the grass, the whole of the produce was given to the bullocks of the farm, which did well on it, and used it with the greatest avidity."

At Seebpore—

"Experiments made with this crop last year confirmed the opinion expressed in the annual report of the previous year that sorghum can be profitably grown as a fodder crop

in Bengal. The produce was sold at 2 annas 6 pies per maund to a Calcutta dairy, the manager of which, Mr. G. C. Bose, a Cirencester scholar, reported very favourably on it. The yield of milk of a number of cows was increased from 20 to 25 seers by the substitution of sorghum for straw; while the cost of feeding was at the same time reduced. Mr. Bose has been so far encouraged by the results that he proposes to grow sorghum as a fodder for his milch cows. The cultivation of sorghum realized a net profit of Rs. 12-12-3 per bigha."

Agricultural implements.

The Seebpore plough has met with some recognition, though not very generally successful. Mr. J. W. Crowdy, of Durbhunga, writes:—

"I find the Seebpore ploughs very useful, especially in light soils. I have now over 40 in use, and the great advantage I find is that they are so light that any bullock who can draw a common plough can work them with the greatest ease, so I have not to keep a large complement of bullocks, as I should have to do if they were heavy and unwieldy."

The Director adds as to other agricultural implements:—

"*Sugar turbine.*—The centrifugal sugar drier, also called the turbine, was exhibited at the Khulna Exhibition, and an experiment made there in manufacture of *dolo* sugar by this machine proved successful. The turbine is coming into use for making *dolo* or *kutcha* sugar out of cane *rab* in the district of Shahabad, and it is not improbable that it may be introduced for the same purpose in Central Bengal, where the manufacture of sugar from date-palm juice is an important industry.

"*Butter-making machines.*—An interesting series of experiments was made during the year by Mr. Howman, who had been deputed to India by the Dairy Supply Company of London to show the working of the centrifugal cream separator and other dairy machines, with the ultimate view of creating a market for them in India. The experiments were made at the Metcalfe Hall in Calcutta, at the Khulna Exhibition, and at Bankipore. A comparative trial between the English method of butter-making by these machines and the native process resulted in favour of the former; but the trials of the dairy machines were far from being conclusive, and leave it an open question which system, native or European, gives the larger yield of butter. Since Mr. Howman left, Messrs. Basu and Banerjee have made a comparative trial between the European dairy machines and the native churn, and have found that, not only in respect of quantity, but also of quality, the former are preferable. Attempts will be made to bring the dairy machines to notice at mêlas and elsewhere."

The cost of these experiments is about six thousand rupees a year.

Use of bones as manure.

With regard to the facts stated on the subject by the Director, the Lieutenant-Governor observes that it is better to export bone-dust, obtaining for it Rs. 2 or Rs. 2-8 a maund, than to leave the bones on some deserted spot, where they do no good even if they do not constitute a nuisance. But what is really desirable is that the ryots should learn to prepare and use this valuable manure for suitable soils. If its use yields a profit to farms in Europe after paying all the cost of carriage, and also to indigo and tea-planters in the country, the dust must also in some cases at least be worth its cost to the ryots. Sir Steuart Bayley observes with satisfaction the progress made in the direction of utilizing a product now generally allowed to waste, as indicated in the following passage:—

"A beginning has already been made by ryots in the use of bone-meal as manure in the districts of Burdwan and Hooghly. Arrangements have been made at Belcooly, Pearapole, and Khanian in the Hooghly district, and also in the Burdwan and Dumraon farms, and at Jheria in Manbhoom, to have bones collected and to have them fermented and ground into meal, and then to distribute the bone-meal at cost price to the ryots of the neighbourhood. In this way it may be possible to offer bone-meal at prices not exceeding Re. 1 per maund. At the suggestion of Mr. Donald Sunder, Settlement Officer of the Western Dooars, and with the permission of Dr. Lethbridge, Inspector-General of Jails, it has been arranged to utilize the labour of Mahomedans, low-caste Hindus, and aboriginal prisoners at the Julpaiguri and Purulia Jails for the grinding of bones. The bone-meal prepared in the jail will be available for sale at cost price to parties applying for it. Mr. Sunder believes that he will be able to induce the jotedars of Western Dooars to use it largely. He has already purchased 50 maunds of bone-meal from Messrs. Croft, Wells & Co., of Bally, and distributed it among the jotedars of the Western Dooars."

The thanks of the Lieutenant-Governor are given to Mr. Finucane for his efficient management of the Department during the year. Mr. Sen also rendered satisfactory service.

By order of the Lieutenant-Governor of Bengal,

P. NOLAN,

Secretary to the Govt. of Bengal.

No. 3410—357Agri.

COPY forwarded to the Secretary to the Board of Revenue, Lower Provinces, Land Revenue Department, for the information of the Board and for communication to the Director of the Department of Land Records and Agriculture.

No. 3411—358Agri.

COPY, with copy of the Board's letter referred to and of the Director's report, submitted to the Secretary to the Government of India, Revenue and Agricultural Department, for information.

No. 3412—359Agri.

COPY, with extract paragraph 138 of the Director's report, forwarded to the Appointment Department of this office for information.

Circular No. 23Agri.

COPY, with copy of the report of the Director of Land Records referred to, forwarded to all Commissioners of Divisions for information and for communication to the several District Officers under them.

By order of the Lieutenant-Governor of Bengal,

T. W. RICHARDSON,

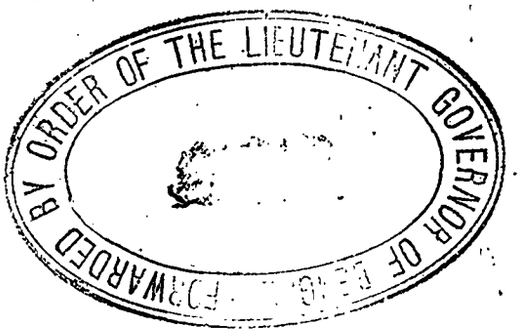
Offg. Under-Secretary to the Govt. of Bengal.

CALCUTTA ;
REVENUE DEPT.—*Agriculture*,
The 2nd October, 1890.

W. J. & T. B. C.—Reg. No. 5908C—1,290—3-10-90.

ANNUAL REPORT

OF THE



DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

BENGAL,

FOR THE YEAR 1890-91.

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1891.

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OFFICE OF DIRECTOR OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BENGAL.

No. 1374 *Agri.*

FROM M. FINUCANE, ESQ., C.S.,

Director of the Department of Land Records and Agriculture, Bengal,

TO THE SECRETARY TO THE GOVERNMENT OF BENGAL,

REVENUE DEPARTMENT.

[THROUGH THE BOARD OF REVENUE.]

Dated Calcutta, the 31*st July* 1891.

SIR,

I HAVE the honour to submit my annual report for the year ending 31st March 1891.

2. This report treats briefly of (1) the surveys and settlements in progress during the year, and (2) of subjects relating to agricultural enquiry and improvement, and the collection of agricultural statistics.

CHAPTER I.

SURVEYS AND SETTLEMENTS AND MAINTENANCE OF VILLAGE RECORDS.

3. Surveys and settlements were carried on during the year in local areas and estates, comprising an area of 11,708·9 square miles in different districts. Of these 49 are Government estates and temporarily-settled zemindari tracts of which the term of the current settlement has expired or is about to expire; 10 are wards' properties, and 21 are private zemindars' permanently-settled estates, the owners of which applied for a survey, record of rights, and settlement of rents, because of disputes existing or likely to arise between them and their tenants, or because, being auction-purchasers at sales for arrears of revenue, they were unable to ascertain the amounts of the rentals payable to them by the raiyats.

4. The statements A and B annexed show the progress made in surveys and settlements and the cost of the operations during and up to the end of the year (1890-91) under report. As remarked in last year's report, the figures given are necessarily approximate, owing to the fact of the report being for the financial, and not for the survey and settlement, year.

ORISSA

Angul.

5. As explained in previous reports, Angul was a tributary State, the Chief of which rebelled and was deposed by the British Government in 1847, when the State was confiscated. Shortly afterwards a settlement of rents was made in 1855 with the raiyats; the village headmen (sarbarakars), who are partly farmers of Government revenue, and partly village servants, entered into engagements, for a period of years, for payment to Government of the entire amount of the rental then settled, minus a commission allowed to them on that amount. The sarbarakars were also allowed to appropriate the profits arising from extension of cultivation during the period of the settlement.

133032

6. The survey of the State was completed in 1889. The total area of it is 881 square miles, of which, it is now reported, 638 miles were cadastrally surveyed (the remainder being jungle and reserved forest), mainly by indigenous agency, under the supervision of the Survey Department, at a total cost of Rs. 1,03,618, or 4 annas per acre on the area cadastrally surveyed. A topographical survey was made of the forests and waste lands.

7. The assessment of the entire State was completed before the end of the year 1890-91, and the records were finally published. The khatians, or extracts relating to each holding, were explained to the raiyats concerned, their objections were disposed of, and the signature of each raiyat was obtained in his khatian. The only work that remained to be done at the end of the year was making fair copies of the khasrahs and khatians, and the taking from the sarbarakars of kabuliyats, the exact conditions of which cannot, under recent orders, be determined till the final report is submitted to the Government of India.

8. The settlement cost Rs. 53,030, the average cost per acre being 2 annas 1 pie. The average cost per acre for both survey and settlement is annas 6 and pie 1 (*vide* Appendix A). The total cost of the operations has been Rs. 1,56,648, against an estimate of Rs. 2,50,000 originally sanctioned.

9. The number and classification of tenants are given in Appendix B. The classification of lands made by the Survey Department was revised during the year by the Settlement Officer, and rentals of holdings were worked out, in detail, by applying soil class rates to the areas of holdings as now classified.

By applying these rates according to the present classification to the area now found to be under cultivation and assessed to rent, the result would be an increase in revenue from Rs. 37,157 to Rs. 1,00,551. This increase being more than it was thought by Government that the raiyats and sarbarakars could afford to pay, it was decided to make the increase progressive on the principle that excess lands, over and above the area under cultivation and assessed to rent at the last settlement, should, in the present settlement, be assessed at $\frac{1}{2}$ the full rates for a period of five years, $\frac{3}{4}$ rates for another period of five years, and then at full rates. The result will be an increase in revenue of Rs. 31,697 for the first quinquennial period, of Rs. 47,546 for the second, and afterwards of Rs. 63,394.

10. The assessment, though resulting in a large increase of revenue is, tried by all ordinary tests, a very moderate one. It is moderate because the rates imposed 35 years ago have not been enhanced even as regards the identical lands to which they then applied, and it is also moderate as representing only a small share of the value of the gross produce. On the other hand, in making the assessment, it had to be borne in mind that land which was formerly jungle has been broken up and reclaimed at the expense of the raiyats, and that they, by the application of manure to barren wastes, have converted them into fertile uplands, and similarly by construction of small bunds and water-courses, that they have converted waste lowlands into good rice-land. The average rent per acre on the assessed area, according to the revised assessment, is only 11 annas 2 pies. An expenditure of Rs. 1,261 was incurred, according to the Settlement Officer's report, on the completion and examination of the survey maps and records, and of Rs. 12,667 on settlement operations during the year.

11. The sarbarakars will maintain and correct the records in accordance with rules made for the purpose and recently approved by the Board.

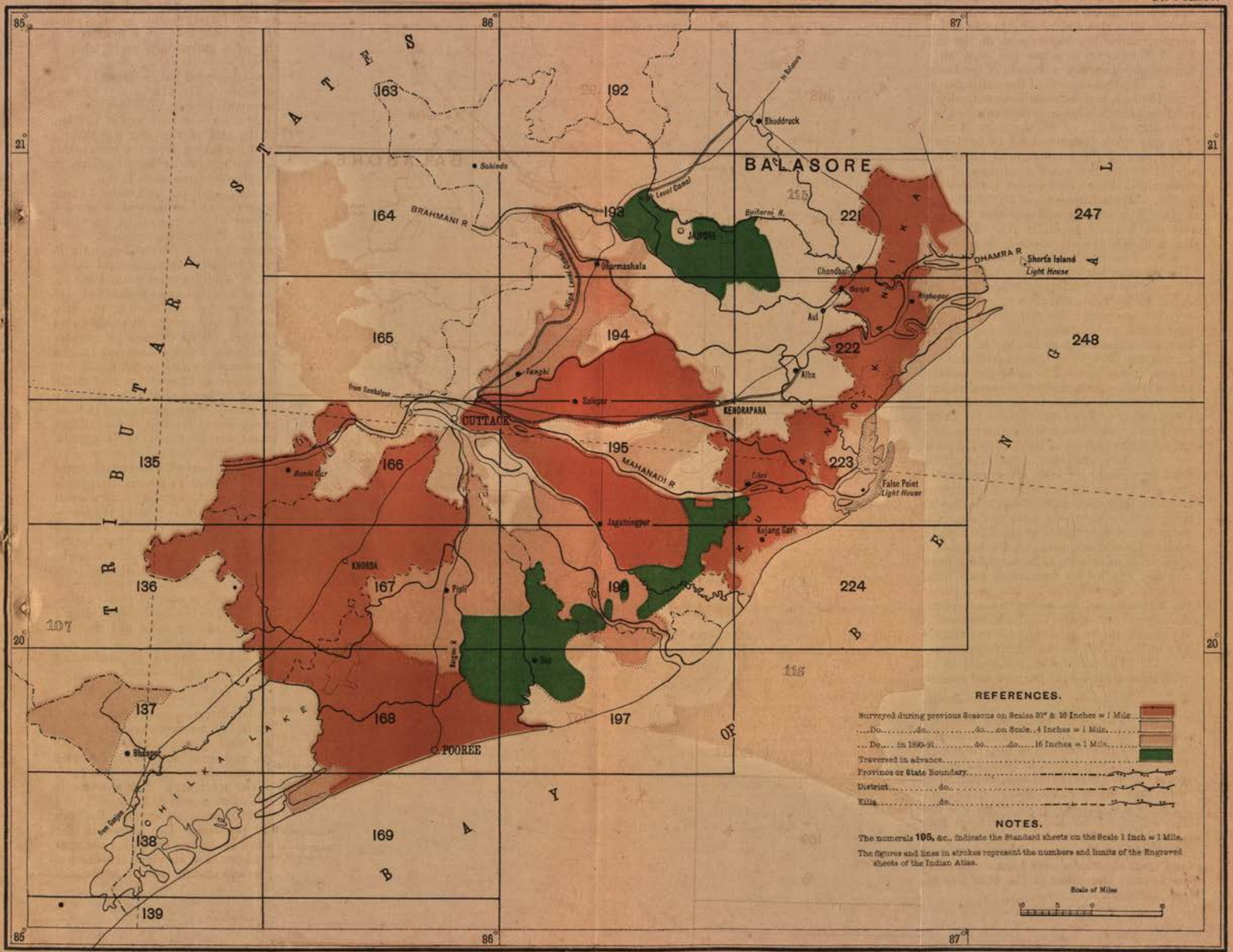
Banki.

12. The Banki estate was brought under direct management in 1843 owing to the Raja having been imprisoned for life. The estate was at first placed under the Superintendent of the Tributary Mehals, but was in 1882 annexed to Cuttack. It was settled in 1844 for ten years, and again in 1854 for fourteen years. The latter period was, owing to the Orissa famine, extended to 1888, when the estate came under settlement. The total area of the estate is 76,800 acres, the survey of which was completed at a cost of Rs. 25,097 and the settlement for Rs. 12,598: total Rs. 37,695, or on an average, for both survey and settlement, annas 7 and pies 10 per acre. The entries in the khatians and the new rentals were explained to the raiyats during the year and their signatures were taken. The only important work which remained to be done at the close of the year was the reorganization of the sarbarakari establishment.

BENGAL SURVEY.

INDEX TO THE CADASTRAL SURVEY OF ORISSA, DISTS. CUTTACK & POOREE.

No. 8 PARTY.



REFERENCES.

Surveyed during previous Seasons on Scales 32" & 16 Inches = 1 Mile.

....Do.....do.....do....on Scale..4 Inches = 1 Mile.

....Do.... in 1890-91.....do.....do.....16 Inches = 1 Mile.

Traversed in advance.

Province or State Boundary.

District.....do.

Killa.....do.

NOTES.

The numerals **195**, &c., indicate the Standard sheets on the Scale 1 Inch = 1 Mile.

The figures and lines in strokes represent the numbers and limits of the Engraved sheets of the Indian Atlas.

Scale of Miles

0 5 0 10

Reg. No. 264, S. I. D.—Sep. 91.—500. Rev. 1,000.

Photo., S. I. O., Calcutta.

13. The assessed and cultivated area of the estate, exclusive of lakhiraj and lands held at nominal quit-rents, is reported to be 32,607 acres, assessed at a revenue of Rs. 32,932 less by Rs. 4,037 deducted on account of commission to the sarbarakars. The settlement has resulted in an increase of revenue of Rs. 7,474. It was made at existing rates, but inequalities of assessment were removed by raising the rents of land held at abnormally low rates to the prevailing rate of the village for lands of the same class. It takes effect from October 1890, and will run for fifteen years. Copies of the records have been supplied to the sarbarakars, who will be responsible for keeping them corrected up to date according to the Board's rules.

General Survey and resettlement of Orissa.

14. The greater part of the province of Orissa was temporarily settled in 1836-37 for a period of 30 years; this settlement expired in the famine year 1866-67, but as Government felt that it would be inexpedient to increase the land revenue of the province at that time, the settlement was renewed, without enhancement, for 30 years. The term of the present settlement will therefore expire in 1896-97. For this reason it has become necessary, with a view to the resettlement of revenue, to undertake a survey and the preparation of a record of rights of the whole province. A scheme was submitted during the year 1889-90 for carrying out the survey, through indigenous agency, under the supervision of the Survey Department, and for the preparation of a record of rights, under a Settlement Officer. Mr. Reily was appointed to be Settlement Officer, and joined his appointment on the 10th February 1891. He is assisted by seven Assistant Settlement Officers, who joined their appointments on various dates subsequently to him.

15. *Survey.*—The survey is at present being carried on in the districts of Pooree and Cuttack. In the year 1889-90 cadastral survey of 360 square miles was completed in Pooree. During the year 1890-91 the cadastral survey of 643 square miles has been completed. Up to date the records of 681 villages with an area of 362 square miles, containing 86,185 separate holdings, have been made over to the Settlement Officer, and are now ready for settlement. By the beginning of next cold weather the records of the whole area surveyed (1,003 square miles) will have been made over to the Settlement Officer. The traverse survey of 1,438 square miles has been completed. The expenditure on survey to the end of June 1891 is reported to be—on traverse survey Rs. 51,960 and on cadastral survey Rs. 1,16,006: total Rs. 1,67,966. Of this amount, Rs. 24,872 is reported to have been expended in the year 1889-90 and Rs. 1,43,094 in 1890-91. Mr. Patterson, the Deputy Superintendent of Survey in charge, estimates that the cost rate of cadastral survey on 1,003 square miles completed to end of June 1891, inclusive of preparation of statistics and tracing of maps, will be Rs. 139 per square mile.

16. *Settlement.*—The Settlement and Assistant Settlement Officers were engaged during the short interval that elapsed between the dates of joining their appointments and the close of the year, in testing the khanapuri, in demarcating in advance for the traverse survey party, in attesting the areas of holdings, and in recording rights and existing rents. Up to the end of the year 11,734 holdings of tenants had been attested and the existing rents of them recorded. An area of 308 square miles was surveyed in 1878 for the Canal Irrigation Department. The maps then prepared have been tested, and it has been found that they represent, with tolerable accuracy, the present state of things, so that a resurvey of this area will not be necessary. A revision-survey will be made, and the khasrahs and khatians of this area will be rewritten during the next cold weather. In accordance with the orders of His Honour the Lieutenant-Governor, the services of patwaries and canoongoes have been placed at the disposal of the Survey and Settlement Officers, and are now being fully utilised in the survey operations. It has been found that patwaries work slowly and measure only from three to four acres a day, but it is hoped that with further experience and training they will, next year, be able to survey eight to ten acres a day. Chowkidars, khandaits, and other service tenure-holders, of whom the number in Orissa is very great, are, to some extent, being utilised as chainmen.

Julpaiguri Western Dooars.

17. It was mentioned in last year's report that the Western Dooars of Julpaiguri were obtained by conquest in 1864. Settlements of them were made from time to time, the last of which will expire in 1891. In the course of an enquiry made in 1874, it was found that the existing maps and records of jotes were untrustworthy. It was therefore decided to undertake a professional survey, and to prepare a record of rights for all classes of tenants. The total area of the Dooars, inclusive of forests, jungle, and waste lands, is 1,913 square miles. To the end of the field season of 1889-90 it was reported that traverse survey of 890 square miles and the cadastral survey of 525 square miles had been finished. The expenditure on survey to the end of the year 1889-90 was Rs. 1,63,014. During the year 1890-91 295·30 square miles were cadastrally surveyed. The total expenditure during the year was Rs. 1,39,684, and the cost rate 10 annas 8 pies per acre on the whole area cadastrally surveyed. An area of about 150 square miles of cultivation, intermixed with forest and jungle lands, remained to be surveyed at the end of the year.

18. *Settlement.*—A report was submitted to Government during the year 1889-90, in which proposals were made for the adoption for South Mynaguri tehsil of certain soil class rates which were slightly in excess of those enforced in the last settlement. These rates were accepted by Government. During the year the rents of 60 jotes in 11 taluks were settled, and the attestation of 763 jotes was completed. The Settlement Officer, Mr. Sunder, reports that an increase in revenue of about Rs. 60,000 may be expected in South Mynaguri tehsil alone by the application of the rates approved by Government to the areas of jotes as ascertained by the present survey. The settlement of this tehsil will, it is expected, be completed by September next. The expenditure on settlement to the end of 1890 was Rs. 24,755, and during the year 1890-91 Rs. 21,547: total Rs. 46,302.

Old Thannah Ramoo in Chittagong.

19. The survey and settlement of Old Thannah Ramoo in the Cox's Bazar subdivision of Chittagong was undertaken in 1888 on the ground that there had never been a regular survey, and that there are no maps to show the boundaries of tenures and holdings in the areas under direct management of Government, nor of permanently-settled estates. Before end of March 1890, the survey of the whole tract had been completed. It was found to contain an area of 1,56,390 acres, or 244·4 square miles. The tracts under survey and settlement comprised that portion of the Old Thannah Ramoo which is bounded by the sea on the west and the Chittagong Hill Tracts on the east.

20. During the year under review the Assistant Settlement Officer in charge, Babu Jogendra Kumar Bose, completed, so far as the lands under Government management are concerned, the attestation of 48 out of a total number of 50 villages. Fair rent decisions were passed in the case of 43 villages. The draft records of 40 villages were published, and the records of 12 villages were finally published. All the land comprised in these 12 villages is under direct management of Government; in the 31 remaining villages there are lands belonging to private permanently-settled estates. Of these 31 villages, attestation of holdings had been finished in 20, and the draft records published. The attestation of all holdings in the whole 50 villages was finished in May 1891; but the final publication of the records and completion of the settlement is being delayed pending receipt of the orders of Government as to the form of lease to be granted to the noabad talukdars and what status is to be assigned to them, whether that of tenure-holders or proprietors. It is expected that the increase of revenue will be Rs. 32,000. The survey has cost Rs. 67,706, or 6 annas 11 pies an acre, and settlement Rs. 11,975, or 1 anna 3 pies an acre.

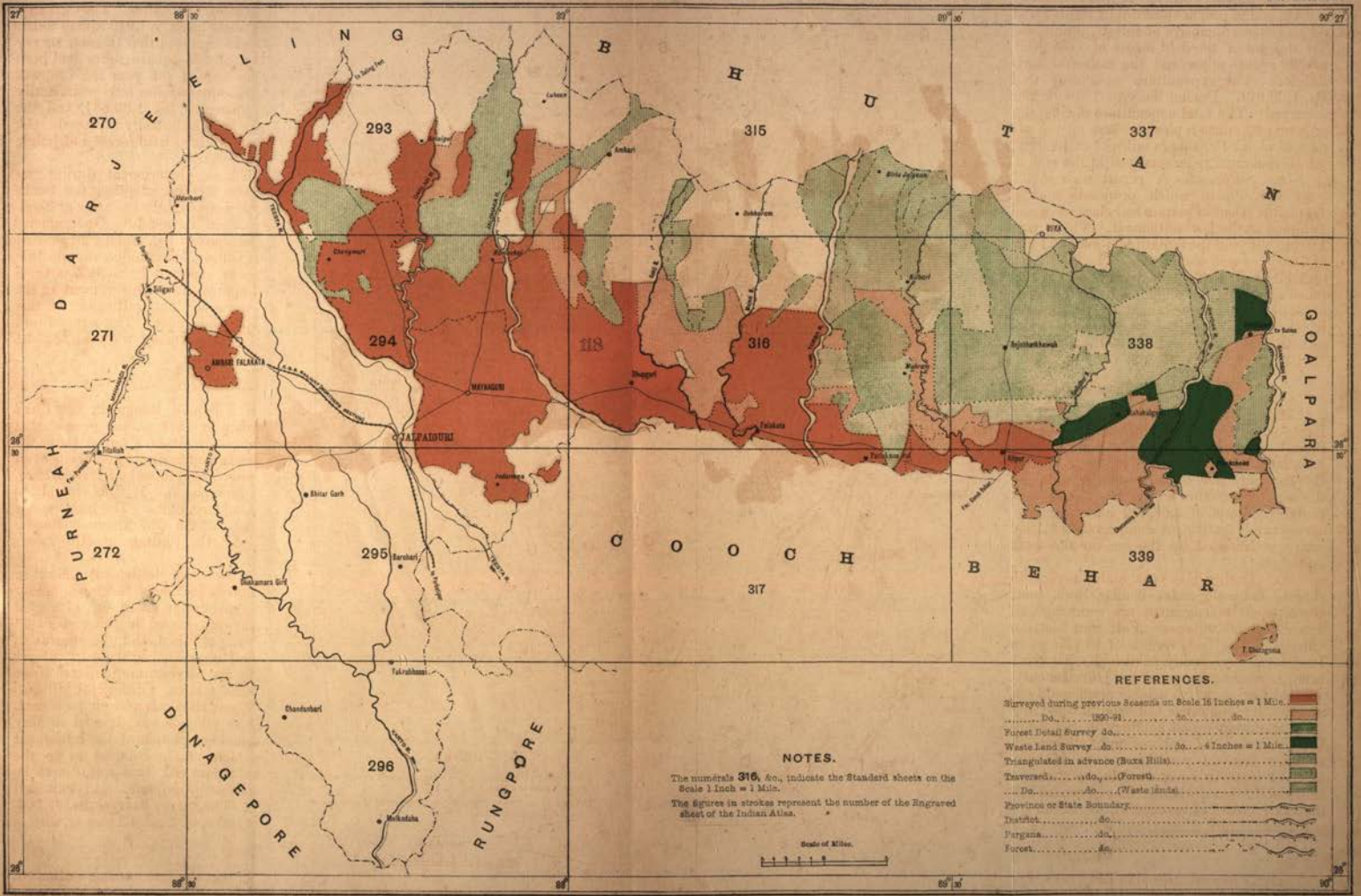
Chittagong District.

21. It was mentioned in last year's report that the first revenue settlement of the Chittagong district, made in 1774, had reference only to lands then under cultivation. The settlement that was then made, after measurement, was confirmed in perpetuity, in 1793. The total area of the estates permanently

BENGAL SURVEY.

INDEX TO THE CADASTRAL SURVEY IN THE WESTERN DOOARS (DIST. JALPAIGURI).

No. 4 PARTY.


DARJEELING
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JALPAIGURI
MAYNAGURI
BIRPARA
Falakata
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Rajabhatkhawah
Bhitar Garh
Barobari
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settled, at that time, and of revenue-free estates was 740 square miles, the total area of the district being 2,717 miles according to Lieutenant Siddon's and 2,498 miles according to the Boundary Commissioners' survey. There thus remained an area of 1,907 square miles according to the former and of 1,621 according to the latter which was not permanently settled. The lands included in this area are scattered throughout the district, and are intermixed with the revenue-free and permanently-settled estates. Temporary settlements of them were made, the term of some of which has already expired, and that of others will expire in different years between the present time and 1898. Hence it became necessary to undertake a survey and the preparation of a record of rights of the whole district, inclusive of the permanently-settled estates, excepting parts of Cox's Bazar subdivision, aggregating an area of 877 square miles, which were surveyed by Mr. Fasson in the year 1877. The total area that remained for survey is therefore 1,840 square miles according to Lieutenant Siddon's survey and of 1,621 according to the Boundary Commissioners. Of this area about 610 miles is estimated to be under jungle, forest and waste.

22. *Sudder subdivision.*—The total area surveyed up to the end of the field season 1889-90 was, according to the Deputy Superintendent's report,—

Sudder subdivision	Traverse ...	617	square miles.
	Cadastral ...	375	„ „
During the year under report ...	Traverse ...	831	„ „
	Cadastral ...	488	„ „
Total ...	Traverse ...	1,448	„ „
	Cadastral ...	863	„ „

23. The actual expenditure up to the end of March 1890 on the survey of the sudder subdivision is reported to be Rs. 34,128-8-10, and from 1st April 1890 to 31st March 1891 Rs. 1,21,195-8-1. The cost rate per acre in 1889-90 on traverse and cadastral survey was, according to the report of the Deputy Superintendent of Survey, 7 annas 9 pies. The highness of the cost is mainly due to the smallness of the plots, which on an average measure only $\frac{1}{7}$th of an acre each; to the fact that all labour has to be paid for; that the wages of labour in Chittagong are very high, amounting to Rs. 8 for each chainman, and to the complexity of tenures which rendered it extremely difficult for the survey ameens to understand or to write up the khasrahs.

24. In a small village of 320 acres there are the following different descriptions of estates and tenures:—

1*st.*—Permanently-settled estates.
2*nd.*—Taluks paying revenue direct to Government—some settled for a period of 30 years and some for 60 years.
3*rd.*—Resumed lakhiraj estates.
4*th.*—Confirmed lakhiraj lands.
5*th.*—Raiyati holdings the rents of which are paid to Government direct.

25. The lands embraced in these several descriptions of estates and tenures are not situated in separate compact blocks marked off by defined boundaries, but are all interlaced like squares in a chess-board, so that one plot in a village with an area of $\frac{1}{7}$th of an acre is part of a permanently-settled estate; the next plot with an area of $\frac{1}{7}$th of an acre is part of a temporarily-settled taluk; a third is part of a revenue-free estate; a fourth is part of an ordinary raiyati holding paying rent direct to Government. Further, the number of these petty estates and tenures is enormous. Some of the permanently-settled estates and taluks cover areas not exceeding an acre each, while the average area of all the estates and taluks of Chittagong is not more than ten acres each. The case is still further complicated by the fact that the same person is often co-owner as talukdar in a taluk with others, and again holds land as raiyat in that same taluk, paying rent, as raiyat, to himself and co-sharer talukdars jointly. Again, the same individual may be the holder of a share of a permanently-settled estate and of a taluk, and be at the same time a raiyat and under-raiyat and holder of lakhiraj land in the same village. With a view to reduce the expense of survey and, so far as possible, to overcome the difficulties arising from the intricacy of tenures, the work of writing up the khasrahs was, during

the year, transferred from the Survey Department to the Settlement Officer. The result has been that the cost rate of survey, traverse and cadastral, during the year under report, is stated by the Deputy Superintendent to be 5 annas 4 pies per acre. The area remaining to be cadastrally surveyed in the next field season is estimated to be 320 square miles, which, it is expected, will be completed by the end of March next; 450 square miles of jungle topographical survey also remain to be done. The Settlement and Assistant Settlement Officers were principally engaged, in the sudder subdivision, in demarcation of boundaries, in the settlement of disputes, and in the supervision of the work of khanapuri which has, as already stated, been transferred to them. Up to the close of the year the khasrah writing of 195 villages had been completed. One hundred and fifty-seven more villages were expected to be completed before the rains set in. The expenditure on settlement operations was to the end of the year 1890 Rs. 7,031 and in 1890-91 Rs. 36,414: total Rs. 43,445. But this amount covers not only the cost of work done, but also much that is in the course of completion. The Settlement Officer estimates that the increase of revenue in the sudder subdivision will amount to Rs. 1,20,000.

Backergunge Government Estates.

26. The survey and settlement of the four following Government estates were placed under the charge of Sub-Deputy Collector Babu Peary Mohan Bose, who is also in charge of the survey and settlement of the Dakhin Shabazpore wards' estate:—

1. Chur Pudma.
2. Taluk Biswanath Thakurta.
3. Chur Shumbhupura.
4. „ Golokepura.

27. *Chur Pudma.*—This is a resumed Government estate, the proprietary right of which belongs to private individuals. The total area according to the present measurement is 1,937 acres, of which 1,329 acres are cultivated.

28. The draft records were published on the 31st July 1890; the final publication was made on the 9th October following. The total cost incurred on account of survey and settlement during the year was Rs. 653-6-6. An increase of revenue, amounting to Rs. 2,296, is reported to have been obtained.

29. *Biswanath Thakurta.*—This is a small Government estate situated in mouzah Digaldi, in pergunnah Uttar Shabazpore, in the subdivision of Bhola. It was purchased on behalf of Government in 1846, and farmed out from time to time. The last farming settlement was made for 27 years at a net sudder jumma of Rs. 25-6; an increase of revenue, amounting to Rs. 35-15-9, was obtained in the present settlement.

30. *Churs Shumbhupura and Golokepura.*—Both these estates were resumed on behalf of Government in 1840. The proprietary right is vested in the zemindars of Dakhin Shabazpore. The cost of survey and settlement on these was 5 annas and 5 pies per acre.

31. The area of Shumbhupura is reported to be 2,559 acres, and of Golokepura 2,023 acres. The settlement resulted in an increase of revenue amounting to Rs. 2,998 and Rs. 2,377 respectively. The total expenditure during the year was Rs. 1,549-13-3.

32. In addition to these four estates, the Settlement Officer, Babu Peary Mohan Bose, settled, under the old regulations, 35 others with an area of 41,666 acres and a jumma of Rs. 50,135 as against Rs. 39,642 at the previous settlement. The increase of revenue was Rs. 10,493.

33. There were also 17 Government estates in Backergunge, which were notified for survey and settlement on the 14th May 1888 and 14th March 1890, under section 101 of the Bengal Tenancy Act, of which Mr. Dwija Dass Dutta was placed in charge. Of these 17 estates, 5 were traversed by a detachment of a professional survey party, 11 cadastrally surveyed, one (chur Drummond) diluviated, and another, chur Price, was surveyed as part of chur Bhoirab. Besides these, two other estates, churs Joynagar and Lamchipata, were transferred to the file of Mr. Dwija Dass Dutta, making a total of 19 estates. But settlement work was begun only in 9 of these estates with an area of 25,677 acres. The details will be found in appendices A and B attached to this report.

Government estates in Midnapore.

34. Only two Government estates, viz., Bhetia and Kamina Chuck, were under survey and settlement.

Bhetia.—The settlement of this estate was completed in February 1891. The estate consists of 23 villages, with an area of 6,698 acres, and 796 raiyats. An increase of Rs. 1,198 was obtained in the rental. The previous jumma was Rs. 1,671, and the present Rs. 2,869.

The survey cost Rs. 1,925, or annas 4 pies 7 per acre, and the settlement Rs. 1,504, or annas 3 pies 7 per acre.

Kamina Chuck.—The settlement operations have been completed, but the final report has not been submitted, pending orders on an appeal preferred by Government to the High Court against the decision of the Special Judge regarding certain lakhiraj claims.

The total area of the estate is 724 acres with 251 raiyats, all of whom are setttled raiyats. An increase of Rs. 1,339 has been obtained in the rental, the previous jumma having been Rs. 2,320, and the jumma according to settlement being Rs. 3,659. The survey cost Rs. 385, and the settlement Rs. 334.

Government estates in Nuddea.

35. *Khosalpore.*—This estate, containing 476 acres, was purchased by Government at a sale for arrears of revenue. The measurement was completed during the year at a cost of Rs. 137, or 4 annas 7 pies per acre on the area surveyed.

Government estates in Noakhali.

36. *Chur Peer Bux.*—The survey of this estate was completed during the year 1890-91 at a cost of Rs. 478 on an area of 5,176 acres. An increase of Rs. 184 has been obtained in the rental. A further increase of Rs. 366 was obtained after the close of the year.

37. *Chur Gazi and Chur Fakira.*—Proceedings under Chapter X of the Tenancy Act were undertaken in these two estates for the reason that the rights of certain classes of tenure-holders were undefined. Both the estates are undergoing rapid diluvion, and are not expected to yield an increase of revenue. An area of 4,410 acres was measured in the former estate (Gazi) at a cost of Rs. 1,132, or annas 4 pie 1 per acre, and 903 in the latter (Fakira) at a cost of Rs. 179, or annas 3 pies 2 per acre. There was no settlement work done during the year under report.

Government estates in Tipperah.

38. *Jowar Baluakandi.*—The measurement of this estate was completed in 1889, and the draft records were published in March 1890. The rental, according to the present settlement, amounts to Rs. 3,407-12-4, and represents a net increase of Rs. 1,205-13-6 on the previous jumma. The final proceedings were reported to Board under my No. 407TA, dated 3rd April 1891, and were approved. The total cost was Rs. 1,447, or 8 annas 4 pies an acre on an area of 2,762 acres.

39. *Pergunnah Singargaon* (*hissa 4 annas and odd*).—A survey and settlement was ordered under the Tenancy Act with a view to settle disputes existing regarding the boundaries of holdings and rates of rent. The survey and preparation of the record of rights were completed at the close of 1889-90. Several objections were filed regarding village boundaries and the classification of soils, etc. All these objections were disposed of during the year, and the final records were published in March 1891. The result has been an increase of Rs. 2,405-13-9 on the previous rental of Rs. 4,791. The increase, as already stated in my report for last year, is partly due to an increase in rates, but mainly to excess area. The total cost was Rs. 3,259, or 13 annas 9 pies an acre on an area of 3,649 acres. The extra expensiveness is due to delay caused in the decision of numerous disputes.

40. *Pergunnah Maizurdi* (*hissa 9 annas*).—This estate was purchased at a sale for arrears of revenue in 1836, and was farmed out to various persons at different times. On the expiry of the last settlement in 1876-77, the estate was brought

under direct management. Two successive measurements were made under Act VIII (B.C.) of 1879, but no settlement was concluded. Consequently orders were issued directing a settlement under Chapter X of the Tenancy Act. The survey was completed during the last cold season, and the draft records were ready for publication at the end of the year. The survey cost Rs. 180, or 5½ annas an acre on an area of 523 acres.

Government Estate Dhanchuhan in Shahabad.

41. The survey and settlement of this estate was sanctioned under Government notification dated 14th February 1889. The settlement of rent was completed and record of rights published during the year under report. Out of 113 raiyats, 35 filed petitions of objections which are being disposed of. A total area of 2,696 acres was measured, and resulted in an increase of Rs. 764 on the previous jummabandi of Rs. 2,700, the rental now being Rs. 3,464.

Srinagar-Baneli Ward's Estates.

42. These estates are held jointly by the Baneli Raja and the Srinagar Ward. The object with which a survey and record of rights of these was undertaken is stated in the Government of Bengal No. 1101T—R, dated 15th September 1886, addressed to the Board of Revenue, thus:—

43. "The Lieutenant-Governor, while on tour in the Bhagulpore Division, consulted with the Commissioner, the Officiating Collector of Purneah, and the Manager, as to the advisability of making a survey and record of rights in the Srinagar Estate. It was ascertained that no trustworthy account of the rent demand was left by the late proprietor, and that none had been compiled since the property has come under the Court of Wards. The annual report of 1884-85, compiled from the imperfect materials available, showed that, with a rent-roll of Rs. 2,86,549 on the portion of these estates belonging to Srinagar Wards, there had been remissions amounting to over ten lakhs, and that a balance of more than four and-a-half lakhs still remained uncollected. Of this much had since been barred by limitation, and no progress whatever had been made towards clearing up the confusion into which the estate had fallen. The Collector, who was at first opposed to a survey, then considers that it is an imperative duty to undertake that task.

44. "The object of the survey was not to make an enhancement, but to ascertain and record existing rents."

45. The survey by a professional party was begun in November 1887, and was completed in October 1889.

46. The total cost of the survey operations was Rs. 1,32,625, the area cadastrally surveyed was 695 square miles, and the area of which traverse survey was made is 745 square miles. The cost rate, inclusive of traverse survey, spread over the 695 square miles cadastrally surveyed, is Rs. 191 per square mile, or 4¾ annas per acre. The property is scattered over the Bhagulpore, Monghyr, Maldah, Purneah, and Durbhunga districts. The lands appertaining to it in Bhagulpore and Monghyr are more or less compact, and in this portion the cost of survey was 3 annas 11 pies per acre.

47. *Settlement.*—The settlement was practically completed by the end of the year. As no trustworthy account of the rent demand was kept by the proprietors, it is difficult to say what the exact increase on the rent-roll, in consequence of the present operations, may be, for comparison has to be made between a rent-roll now certain and defined with one that was nominal and fictitious. The revised rent-roll, so far as can be now ascertained, is Rs. 4,14,138 against a previous rental claimed for the same area of Rs. 3,88,999. Of this rental, about three-fifths appertain to the Srinagar Ward's Estate and two-fifths to the Baneli Estate.

48. After clearing up the confusion in accounts, the increase of rent on the true jummabandi is Rs. 25,140, or 8·9 per cent. on the total outlay.

49. *Cost of settlement.*—The total cost of the settlement proceedings up to the 31st March 1891 was Rs. 1,48,005, equivalent to 5 annas 5 pies per acre. The estimated cost was 4 annas per acre. Of the total outlay, however, Rs. 8,000 has been realized in the shape of stamp and copying fees, and will

be deducted. The cost stated above includes expense of four copies of the records—one for Collector, one for each of the proprietors, and one for the raiyats. The total cost of survey and settlement is—

		Rs.
Survey ...	...	1,32,625
Settlement	...	1,48,005
		2,80,630
Against estimate of	...	2,50,000

When the cost of stamps and copying fees is deducted, and allowance is made for expenditure which remained to be incurred at the close of the year, the original estimate will be exceeded by about Rs. 20,000; but it is to be remarked that the number of copies of the record furnished to the landlords at their request is larger than was estimated for. The fact that the amount of the rent was disputed in so many cases and the scattered nature of the estates also added to the cost.

50. *Method of settling fair rents.*—Existing rents were first ascertained either by judicial decision as to the actual rents where the amount of them was disputed, or as to the rates. No attempt was made to alter rates or to fix new rates. The object was to ascertain what were the recognized rents or rates of rent of the village. When existing rates or rent had been ascertained, enquiry was made as to areas. If the landlords could prove a previous measurement, the areas of holdings recorded at the last measurement were compared with the areas found by survey. An allowance was made for the difference in the method of measurement and for more accurate survey. This allowance varied according to the actual difference found by comparison of the survey areas of particular fields with the areas of the same fields as shown in the landlords' papers. In Bhagulpore the allowance was at first 4 kattas per bigha, which was reduced by the Appellate Court to 3 kattas, and in Monghyr and Purneah the allowance was $1\frac{1}{2}$ kattas. After making this allowance, the area then found in excess of the former area was treated as a real addition to the holding, and was assessed at the village rates, where there were recognized rates, or at the average rate paid for the rest of the holding where there were no rates recognized.

51. The object of the settlement not being so much the enhancement of rentals as the ascertainment of a clear rent-roll and the clearing up of the confusion of accounts, to this latter end the officials of the estate drew up a statement of arrears alleged to be due from every raiyat, and these statements were compared with the settlement records, so as to regulate the demand for disputed arrears, according to the decision of the Settlement Court. Two lakhs of rupees being disputed and irrecoverable, were remitted in 1889-90, and the total remission since 1885 is two and-a-half lakhs. Rents are now being collected according to the rent-rolls framed by the Settlement Officers, with the result that the collections in the year 1889-90 amounted to 112 per cent. on the current demand, against 70 per cent. of the preceding year.

52. *Work which remains to be done.*—In Akbarabad pergunnah of the Maldah district, containing 30 villages and an area of about 15 square miles, a dispute arose as to the standard of measurement. The proprietors based their claim on the standard recorded at the time of the revenue survey, viz., five cubits, and the raiyats claimed that the pole was six cubits of 22 inches. The dispute was judicially decided in May 1890 in favour of the landlords. The raiyats appealed, and, pending the decision of the appeal, both parties have applied to have settlement work deferred. The Settlement Officer, in an enquiry made in November last, ascertained that the proprietors had no records of a previous measurement, and ordered existing rents to be recorded; but the Managers of both estates, and the Collector of Bhagulpore, who is responsible for the management of the Srinagar Ward's Estate, applied for delay, as they hoped, on the decision of the appeal, to arrive at some compromise as to rentals. The appeal having since been decided in favour of the estate, the Manager and Collector were willing to accept the existing rentals as fair; but the raiyats set up claims to hold at fixed rates, and have since absented themselves altogether from the

proceedings. Mr. Collin, the Settlement Officer, is now preparing the Final Report, which will be submitted within the next month.

53. *Realization of costs.*—Under the orders of Government, it was decided that the raiyats shall pay 2 annas an acre on the areas of their holdings, and that the landlords pay the balance of the costs in proportion to their several interests.

54. The raiyats have, since the receipt of Government orders, voluntarily paid Rs. 4,524-9 in the pergunnahs Sujanagur, Dehat, and Tajpore, which have been under settlement since receipt of the orders apportioning the cost.

55. *Maintenance of records.*—There were 151 patwaries in the Srinagar Estate, of whom 48 have received certificates of proficiency in survey and a considerable proportion of the others have had some training in the survey schools. Since the commencement of the operations, the number of patwaries has been reduced by 47, care being taken to weed out useless men. Thus there are now 104 patwaries, of whom 48 are proficient in surveying, and the rest have received some training. The estate has, it is believed, recently passed out of the management of the Court of Wards.

Burdwan Raj Khas Mehals.

56. *Sujamutha.*—Survey of the khas mehals of the Burdwan Raj was undertaken in January 1889, because the existing rent-rolls were reported to be in confusion. The survey was completed last year. It was stated in last year's report that the Manager, Mr. Reily, was instructed to endeavour by amicable arrangement with the raiyats to determine what would be fair rents acceptable to them and the managing authorities, so that if the parties came to an amicable arrangement among themselves, the duty of the Settlement Officer would have been confined to the determination of the status of the different classes of tenants, and to recording the rents agreed to by the parties. Mr. Reily having failed to come to an amicable settlement, the Settlement Officers were obliged after numerous adjournments, granted on the application of the parties, to proceed to settle fair rents according to law. In the first case decided in pergunnah Sujamutha, Mr. Dwijendra Lall Roy reduced the existing rents on the ground that the soil had been permanently deteriorated owing to the silting up of the drainage khals and of the Kalinagar river. The Manager appealed against this decision to the Special Judge, who reversed the judgment of the Settlement Officer. The raiyats have since appealed to the High Court. In other cases a compromise, on the basis of the existing rents being accepted as fair, has been come to between the raiyats and the Manager, Lala Bun Behari Kapur, details of which are now being worked out.

57. *Hukumapur.*—The draft records of Lot Hukumapur in Beerbhoom have been published, and the settlement proceedings have been completed. The result has been an increase in the previous rental of Rs. 1,895; the settlement rental being Rs. 13,580 against a previous rental of Rs. 11,685. The total cost of these proceedings, which, owing to the numerous delays and adjournments which occurred, were exceedingly expensive, was Rs. 13,481, or annas 14 an acre on the area settled. Mr. Shaw, an Assistant Surveyor of the Survey Department, was engaged during the year in making a traverse survey and demarcating the boundaries of villages in the estate known as towji No. 4 in the Bankura district. As described in last year's report, a large number of mouzahs belonging to the Burdwan Raj had, in the confusion that prevailed in the Raj zemindari records, been allowed to go out of the possession of the Raj, and been wrongfully appropriated by others. The object of the traverse survey and demarcation of boundaries is to trace out these mouzahs and enable the Raj to sue for recovery of possession of them. The present Manager, Lala Bun Behari Kapur, reports that the work done is valuable to the Raj; that he has been enabled to resume khas possession of some of the missing villages, and though opposed to the undertaking of survey at the beginning, now asks for the extension of it to towjis Nos. 1 and 3 of the Bankura district.

Kanika.

58. The survey of this estate was also completed last year. During the year 1890-91 the Settlement Officer, Mr. Srinath Dutt, tested holdings and settled

rents of 6,738 tenants, with the result that the previous rental of Rs. 23,978 was increased to Rs. 27,709, or 15 per cent. Since the close of the year Mr. Srinath Dutt has been transferred to Burdwan, and Mr. Sakhawat Hossain has been placed in charge.

Kujong.

59. The survey of this estate, which appertains to the Burdwan Raj, was completed last year. The total number of raiyats on the estate is 36,085. Of these, the rents of 14,512 were settled during the year, with the result that the previous rental of Rs. 63,527 was increased by Rs. 814. The total expenditure incurred on settlement to end of March 1890 was Rs. 6,007, and during the year 1890-91 Rs. 9,769: total Rs. 15,776.

Dinajpore Ward's Estates.

60. *Sunkerpore, Churamon, and Maldwar Wards' Estates.*—The final reports of the survey, record of rights, and settlement of rents of these estates, aggregating respectively an area of 247, 86, and 154 square miles, were submitted during the year under report. The total expenditure on these estates, both of survey and settlement, was Rs. 2,27,981, the total increase of rent being Rs. 21,695, or nearly 10 per cent. on the outlay.

Dakhin Shabazpore Wards' Estate.

61. The undertaking of survey and the preparation of record of rights of these estates were recommended by the Commissioner of Dacca in his letter No. 2308, dated 24th October 1887, and ordered by Government in their letter No. 2454—1071LR, dated 28th July 1888. The management of the Dakhin Shabazpore Wards' Estate was accepted by the Court of Wards in June 1886, at the request of the Civil Court under section 95 of the Tenancy Act, on the ground that disputes existed between the proprietors which were likely to cause inconvenience to the public or injury to private rights. The old records and collection papers of the property were lost in the cyclone of 1876, and as there has been no regular settlement made since, "a trustworthy rent-roll on which the Collector can fairly be asked to make out a certificate of arrears" does not exist. It was the confusion in the accounts which primarily led to the estate coming under the Court of Wards. There are eight adult co-proprietors of independent means, all of whom agreed to have the survey made and a record of rights prepared.

62. Dakhin Shabazpore pergunnah is divided into two *pattis*—a nine-anna and a seven-anna patti—and contains two mehals or estates with separate numbers, 1763 and 1764, in the Collector's towji. The wards (if they may be so called) are sole proprietors of mehal 1763, consisting of the whole of the seven-anna patti (which they hold separately), and a 5*a*. 18*g*. 2*c*. 1*k*. share in the nine-anna patti. Estate 1764 consists of the remaining 3*a*. 1*g*. 1*c*. 2*k*. of the nine-anna patti, and is held jointly by the wards and others. It thus appears that there are no lands in the pergunnah in which the wards have not got some interest; it was therefore found necessary to measure the whole pergunnah. The co-sharers in towji No. 1764 at first refused to join the Court of Wards in an application for a survey and record of rights, but they have recently submitted a conditional application for permission to join in the preparation of a record of rights.

63. The total area of the pergunnah, as now ascertained by survey, is, the Settlement Officer reports, 130·65 square miles, or 83,616 acres.

64. The survey was begun by a detachment of a professional party in November 1889, under the general control of the late Colonel Steel, but under the immediate supervision of Mr. J. McHatton. The survey work was finished in June 1890, but the khanapuri of only 17 miles of the Dakhin Shabazpore

Wards' estates had been completed when the survey party were compelled to stop work.

65. The actual cost of survey as given by the Deputy Surveyor-General to the end of March 1890 is Rs. 44,928, and during 1890-91 Rs. 2,173.

66. But this does not represent the total expenditure on survey, for the Survey Department has given merely traces of the maps of the whole area, and the khanapuri of only 58 miles inclusive of Government villages, so that the khanapuri of all but these 58 miles has had to be done during the past cold weather under the supervision of the Settlement Officer. The cost of this khanapuri is estimated to be Rs. 13,088.

67. *Settlement.*—The Settlement Officer, Babu Peary Mohan Bose, was appointed to be Settlement Officer in December 1889. During the cold weather of 1889-90 he was employed in demarcation of boundaries, in assisting the Survey authorities in procuring the attendance of the raiyats, and at the same time he was engaged in the settlement of Government estates in Backergunge. During the past cold weather he has been engaged in completing the khanapuri of the Dakhin Shabazpore Wards' Estate which was left undone by the Survey Department.

Complication of tenures.—The complication of tenures is great and almost beyond comprehension of anybody who has not been on the spot. The result is that the record of rights is a matter of extreme difficulty.

The annexed diagram (Appendix C) shows the intermediate tenures existing between the proprietors on the top and the raiyats at the bottom of the scale. It will be seen that Kamiruddin, who cultivates one plot of land, holds a $\frac{7,021}{12,288}$ share of it as occupancy raiyat under a howladar, named Abdul Hashim Sikdar, a $\frac{1,175}{3,072}$ share as raiyat at a fixed rent under another howladar, Kali Prosanna Gupta, a $\frac{105}{3,072}$ share as occupancy raiyat under the same Kali Prosanna Gupta, and a $\frac{147}{12,288}$ share as under-raiyat under Abdul Hashim Sikdar in occupation of one plot of land.

68. The total expenditure on settlement up to end of March 1890 was Rs. 434, and during the year 1890-91 Rs. 3,987. The Settlement Officer also expended in survey work Rs. 1,780.

69. *Principles on which the Settlement is being made.*—On the application of the Manager of the Court of Wards, and of the proprietors of towji No. 1763 and No. 1764, the Settlement Officer can only settle fair rents for their immediate tenants, that is to say, he can only settle the rents of the tenants who pay rent direct to the proprietors. These tenants may be talukdars, howladars, nim-howladars or cultivating raiyats paying rent to the proprietors direct. If the Manager applies for settlement of rent of a talukdar, the Settlement Officer has to consider and decide whether the taluk is one at a fixed or at a variable rent. If it be one at a fixed rent, the Manager has no concern with the rents of the talukdar's under-tenants, but if the rent is a variable one, then the Settlement Officer has, in order to ascertain what is the fair rent payable for the taluk, to ascertain the rent of the talukdar's under-tenants. If the talukdar in the latter case applies for settlement of fair rents of his under-tenants, the Settlement Officer is bound to settle a fair rent for them, and to take the fair rent so settled as the basis on which the rent payable by the talukdar to the proprietors is to be calculated. The same rule applies to the various grades of under-tenures, that is to say, a fair rent for tenants of each grade is being settled on the application of the immediate landlord of these tenants, or on the application of the tenants themselves; but fair rents cannot be settled for tenants of the lower degrees on the application of a tenure-holder of the higher degrees, other than the immediate landlord to whom the rent of the tenant is payable.

Serail Pergunnah Ward's Estate.

70. The survey of the Serail estate, the property of Ashutosh Nath Roy, a minor of the Court of Wards, was commenced in December 1889 by a detachment of a professional survey party, under the immediate supervision of Mr. Grant, of the Survey Department. The total area of the estate, the survey of which was completed during the year, is 282 square miles. The expenditure on survey to the end of the year 1889-90 was Rs. 30,969, and during the year under

BENGAL SURVEY.

INDEX TO THE CADASTRAL SURVEY OF PARGANA SERAIL, DIST. TIPPERAH.

No. 2 PARTY.

Reg. No. 337, S. I. D.—Sep. 91.—550. Rev. 1,000.

Photo., S. I. O., Calcutta.

report it was Rs. 90,329. The Settlement Officer, Babu Kali Sunker Sen, began to settle fair rents in December 1890; by the end of the year he had settled fair rents for 1,410 tenants. The previous rental of these tenants was Rs. 5,604 and the new rental Rs. 7,230; increase Rs. 1,626.

71. *System of settlement.*—The system of assessment followed is as follows:—Where the area of a holding according to the present survey is not more than 20 per cent. over the area recorded in the zemindar's papers, the existing rent is allowed to stand, and no increase is claimed on the ground of excess area. Similarly, where the area by present survey is less than that shown in the zemindar's papers, if the deficiency is small, the existing rent stands. Where there is an increase by the present measurement of more than 20 per cent., the Settlement Officer makes a deduction of $3\frac{1}{2}$ gandas per kani from the area found by survey, and assesses the whole of the survey area, after this deduction is made, at the existing rates. This allowance of $3\frac{1}{2}$ gandas per kani, or $\frac{7}{40} = 17\frac{1}{2}$ per cent. of the survey areas, represents, the Settlement Officer says, generally, the difference between the areas of fields ascertained by the native method of measurement, which excluded ails or paths between fields, and the areas of the same fields as now ascertained. In other words, the areas of fields by the professional system of measurement according to what is now declared to be the standard pole of the pergunnah would, if this allowance were not made, be generally $17\frac{1}{2}$ per cent. more than the area of the same fields as recorded in the zemindari papers, which areas, it is said by the zemindar, were ascertained by a measurement according to the standard now adopted by the Settlement Officer.

72. The increase of rent is partly due to excess area which is still found in many holdings after the allowance mentioned in the preceding paragraph is made, and it is also partly due to the fact that the Settlement Officer has assessed at prevailing rates some holdings hitherto held at favoured rates.

73. *Prevailing rates.*—There are in many of the villages of Serail recognized rates, paid by a majority of tenants, for all lands situated in certain local areas or subdivisions of villages known as *bandhas*. These bandhas are not the same thing as the *hars* or *mats* of other parts of the country, where the *har* surrounding the village pays a high rate because it is the best manured or most favourably situated; the middle *har* pays next highest, and the outlying lands the lowest rent. In the villages of Serail these *bandhas* are known as the northern, the southern, the western bandha, or they are called by the name of an individual. All the lands north of the village up to and adjoining the village site form one bandha, and all the lands situated in it generally pay at one rate, whether the land immediately adjoins the village site or is remote from it, and whether it grows rice, or jute, or tobacco, or any other crop; and so of the other bandhas. There are separate rates for different *bandhas*, but only one rate in one *bandha*.

In these bandhas some few individuals hold at rates which are less than the generally known and admittedly prevailing rate for the whole bandha, and in such cases the Settlement Officer has (rightly, I think) enhanced their rents up to the prevailing rate for that bandha, *e.g.*, in village Sitashai there are two bandhas known as—

1. Manaibadi Tanchur. | 2. Madhogangkhul.

In the former the rate is 11 annas and in the latter Re. 1 per kani. Both *bandhas* grow rice and other crops, but the lands of the latter bandha are lower than those of the former and grow heavier crops. Of 56 raiyats in bandha Tanchur, 43 pay for lands of all classes, in the bandha, at an uniform rate of 11 annas per kani and 13 pay at lower rates. The Settlement Officer has enhanced the rates paid by the 13 to the prevailing rate. He says the 13 raiyats in question admit that these lands are of the same description as those of the 43, that he has personally satisfied himself, by investigation on the spot, that they are so, and that there is no sufficient reason for these 13 raiyats being allowed to hold at the lower rates. This is one of very few cases met with in the settlement operations in progress in Bengal where a true "prevailin grate" exists.

74. The present rental of the whole estate is Rs. 2,20,000. The Settlement Officer estimates the increase of rental resulting from the present settlement will be from Rs. 25,000 to Rs. 30,000.

PRIVATE ESTATES.

Dubalhati Estate.

75. The circumstances under which these estates came under survey and settlement were described in the reports of previous years. The proceedings were undertaken owing to the existence of disputes between the Raja of Dubalhati and his tenants which were likely to end in a breach of the peace. The settlement was completed during the year, and the final report will, the Settlement Officer states, be submitted soon. An increase in the rental of Rs. 18,177 has been obtained under the terms of an amicable compromise. Friendly relations between the tenants and Manager of the estate have, with a few exceptions, been restored, and the raiyats have voluntarily paid half the cost of the proceedings.

Mollarpore.

76. The survey and record of rights and settlement of rents of this estate was also rendered necessary because of disputes likely to lead to a breach of the peace which existed between the proprietor, Mohant Gopal Das, and his raiyats. The total area of the estate, the survey of which was completed during the year, was 26,680 acres. I visited the estate during the year, and, as in other similar cases, suggested terms of compromise, which it is reported has been accepted by the landlord and many of the raiyats.

Private estates in Tipperah.

77. *Alakdia Durgapur.*—This is a private estate belonging to the Maharaja of Hill Tipperah. A survey and record of rights were ordered to be made in consequence of disputes existing between the proprietor and his tenants regarding rents. The measurements were completed in 1889, but the draft records were not published till May 1891. An increase of Rs. 700 is expected in the rental. The cost for survey was Rs. 857, or 2 annas 11 pies an acre on 1,264 acres.

Private Estates in Midnapore.

78. The survey and settlement of 13 private estates, noted in the margin, were ordered to be undertaken, or were in progress, in this district, during the year under report. The settlement of the first three was pending from the previous year (1889-90); Nos. 4 to 8 were taken up during the year; Nos. 9 and 10 were struck off on the application of the proprietors. The survey of Nos. 11 to 13, the Commissioner reports, could not be taken in hand during the year, as the amins were employed on other estates.

1. Kesiari.
2. Gur Moyna.
3. Dakhin Moyna.
4. Sudampore.
5. Gur Safat.
6. Chowrachuk, No. 363.
7. Nimak Mehal.
8. Belaberia.
9. Chowrachuk, No. 365.
10. Uttampore.
11. Maguri.
12. Srikantha Kalaganda.
13. Benagalsia.

79. The progress of work reported is as follows:—

Kesiari.—A record of rights of this estate was, at first, prepared by Babu Bisseswar Banerjee. Orders were issued for revision of the settlement records on the ground of irregularities in the Settlement Officer's proceedings; but on appeals being preferred to the Special Judge, his proceedings were upheld in the case of 4 out of the 41 villages comprised in the estate, the parties in the remaining villages having come to an amicable settlement.

There are 2,154 raiyats in this estate. The settlement has resulted in an increase of Rs. 578 on the previous jummabndi of Rs. 5,886.

80. *Gur Moyna.*—The proceedings of this and the following three estates:—

Dakhin Moyna,	Sudampore,	Mouzah Gur Safat,

were completed during the year under report, the total area thus settled being 1,293 acres at a cost of Rs. 742. There are 565 raiyats on these estates, and pay a rental of Rs. 5,089, against the previous jumma of Rs. 4,980.

81. *Chowrachuk, No.* 363.—This is a small estate with an area of 550 acres. The survey was commenced on 22nd March 1891, and is now in progress.

82. *Nimak Mehal.*—This estate came under survey and settlement, because of disputes between the raiyats and landlords, on a petition of the raiyats, who deposited the cost. There are eight villages embraced in it with an area of 3,924 acres. The survey was taken in hand on the 11th February 1891, and is near completion.

83. *Belaberia.*—The estate comprises six villages. The measurements were completed on the 3rd February 1891, and the record of rights is in progress. The area by the present measurement is 821 acres.

84. Final reports were submitted during the year for the following six estates:—

Bogri (Bachua, &c.).	Gur Purusuthampore.	Kodalia.
Bogri (Kharikasuli, &c.).	Purbapitpore.	Kripanandpore.

The total area of the above estates surveyed and settled was 2,477 acres at a cost of Rs. 3,415. There are 1,155 raiyats on these estates whose rental is Rs. 9,250 according to the present settlement, as against Rs. 6,811, the previous jummabandi, exclusive of Gur Purusuthampore, the previous rental of which is not known.

CHAPTER II.

ANALYSIS OF DISTRICTS.

85. Mr. Bhupal Chandra Basu was engaged during part of the year in making an analysis and preparing a report on the Nuddea district, similar to that prepared by Mr. Ambica Churn Sen for the Dacca district. Mr. Nagendra Nath Banerjee made a tour in Cuttack, and is now engaged in writing a report on the agriculture of that district. Advantage was taken of this tour to institute a series of experiments in the Madhupore Wards' Estate, an account of which will be found in the chapter on agricultural experiments in wards' estates. Both of these officers, in addition to the preparation of analyses of districts, were employed in supervising agricultural experiments in the experimental farms at Seebpore, Burdwan, and Doomraon, and in Government and wards' estates.

CHAPTER III.

RENT AND REVENUE IN PRECARIOUS TRACTS.

86. Nothing has been done during the year that comes under this head.

CHAPTER IV.

MEASURES OF PROTECTION AND ARBORICULTURE.

Burma Emigration.

87. This subject has engaged attention since 1888. It was stated in last year's report that I was deputed to Burmah in March 1889 with some gentlemen who were desirous of taking up land there for cultivation by Beharees. Rules were drawn up on that occasion, under which land can be obtained in Burmah on very favourable terms by Behar cultivators and capitalists, and an agreement was afterwards come to with the British India

Steam Navigation Company, under which deck passengers, certified to be State emigrants from Behar and Chota Nagpore, will be carried from Calcutta to Rangoon at Rs. 5 a head instead of Rs. 10, the present fare; Government undertaking to pay the Company a subsidy of Rs. 2-8 per passenger. The Government of India has sanctioned these proposals, and I am about to go with the Hon'ble Mr. Mackay, C.I.E., on a tour in Behar for the purpose of starting recruiting agencies, and generally giving effect to the agreement made with the Company.

The Agent of Rai Jai Prakash Lal, Dewan of the Maharaja of Doomraon, who obtained a grant of 10,000 acres of land in Burmah, sailed from Calcutta on the 6th June with a batch of 35 emigrants from Behar, who are to settle on and cultivate lands in his grant.

Planting of fruit trees along roadsides.

88. A list of plants available at the Botanical Gardens at Seebpore was again forwarded to all Commissioners of Divisions with a view to their applying to Dr. King for the plants mentioned in it. Fifty-five thousand two hundred and four plants and 3,132 packets of seeds were supplied by Dr. King to local officers and District Boards during the year.

Planting of fruit trees in Hazaribagh.

89. Apple, pear, orange, peach, and plum trees were supplied to certain gentlemen at Hazaribagh and Ranchi in 1889, and are reported to be thriving. The peach trees are bearing fruit at Ranchi and some of the apple trees at Hazaribagh. During the year under report nectarains, phalsa, coranda, pumalow, limes, citrons, Avacado pear, bull's heart, lichee, supporta, and date trees were supplied to a gentleman at Ranchi, who reports that they are doing well, and that some of them are bearing fruit. The Superintendent of the Reformatory School at Hazaribagh reports that grape vines which were supplied to him are most promising, and that they are well suited to the climate.

Date-palms.

90. The Deputy Commissioner of Hazaribagh reports that two out of 237 seedlings of date-palm reared from seed supplied to him in 1888 have perished: the rest are in fair condition, though they do not seem to have grown higher since last reported on. Their stems, however, have grown thicker, and are about 3 inches in circumference just above ground level. The Collector of Shahabad reports that experimental cultivation of the date-palm was carried on by the Arrah Municipality and the Subdivisional Officer of Sasseram. The Vice-Chairman of the Arrah Municipality states that out of the 50 seeds supplied to the municipality, 20 germinated and 30 dried up. The seedlings have grown a foot high. The Subdivisional Officer of Sasseram reports that experiments were made in growth of date-palms in three places, viz., Sasseram, Deoria, and Nasrigunge. The seed planted at Sasseram has germinated well; that planted at Deoria a few weeks later has come up; that at Nasrigunge was planted only lately, and has not yet germinated. The Subdivisional Officer reports that the plants that have germinated are looking well. The District Engineer, Patna district, reports that from one seer of Egyptian date-palm seed received last year, 104 young trees have sprung up, and out of 85 young trees of the previous year's lot only 81 are in existence. In all there are 185 young trees at present, and these are thriving very slowly.

Some seeds of the date-palm were also supplied to the Deputy Commissioners of Manbhoom, Singbhoom, Lohardugga, and to the Subdivisional Officer of Palamow. The Deputy Commissioner of Manbhoom reports that only a few of the seeds germinated, but all the seedlings died within a short time. In the district of Singbhoom the experimental cultivation of date-palm was also undertaken, but without much success. Of six experiments made in the Lohardugga district, three are reported to be successful. In two other places in the same district a few plants have survived, and are making fairly satisfactory progress. The Subdivisional Officer of Palamow reports that only 8 date-palms have survived out of a large number sown.

Eucalyptus tree.

91. The Deputy Commissioner of Hazaribagh reports that he has now 100 eucalyptus plants, and that they are all in good condition. The trunk of the plants that were topped the year before last are now about 20 inches in circumference 9 inches above ground level and 14 inches in circumference 6 feet above ground level, the plants themselves being about 25 feet high. The few plants that were not topped are now 30 feet high, their circumference being 16 inches and 12 inches taken at heights 9 inches and 6 feet above ground level respectively.

Divi-Divi tree.

92. The Deputy Commissioner, Sonthal Pergunnahs, reports that the trees in the compound of the Katikoond and Jhilimili bungalows are doing well.

Inga Samun (rain tree) and Abbizzia Procera.

93. The Collector of Maldah states that seedlings of the rain tree in that district are thriving. The trees on the roadside of the Arrah Municipality and in the Arrah municipal gardens are reported to be doing well, as are the seedlings of Pithecolobium Samun in Chumparun. In Sarun the plants have attained a height of about 20 feet. In Arrowa they have grown 10 to 15 feet high. The Manager of the estate says that the trees do not appear to have any special value in reclaiming *usar* lands.

Vanilla.

94. Cuttings of vanilla, which produces pods of high commercial value, were supplied to Mr. Doobay, Manager of the Gurgung Jhora Tea estate in the Julpaiguri Dooars in 1889. He reports that they are not doing well.

SILK EXPERIMENTS AND ERADICATION OF PEBRINE.

95. The management of the silk experiments, undertaken with a view to the eradication or mitigation of the disease of pebrine, continued in the hands of the Silk Committee, aided by a local Sub-Committee, who supervised the work at Berhampore. Mr. Nitya Gopal Mukerji, the expert in charge of the experiments, had the executive control of the experiments. At the request of the Government of India, his services were placed temporarily at the disposal of the Government of the North-Western Provinces for the purpose of introducing Pasteur's system at Dehra Dun and Kashmir.

Out-stations were opened at Pakhuria, Alipore, Nagri, Kalimpong, and Gopalgunge, with the object of raising healthy industrial seed from microscopically selected seed, away from the silk-producing districts, for distribution to villagers in these districts. The results obtained from these out-rearing establishments, as well as in the central establishment at Berhampore, though not quite satisfactory, have shown, in the opinion of the Committee, that industrial seed may be raised under favourable conditions, which yields excellent results. A detailed report of the operations has been submitted by the Committee.

In the last annual report allusion was made to certain experiments which were being conducted by Mr. F. E. Keighly in the district of Midnapore. It was then stated that Mr. Keighly claimed to have discovered a simple method, independent of the microscope, of detecting pebrine and other diseases. The results obtained by his method have since been partially tested in the presence of Mr. Nitya Gopal Mukerji, and have been found to correspond very closely with those obtained with the microscope. Mr. Keighly's experiments showed that worms fed with leaf purchased from silk rearers gave an unhealthy stock, while eggs obtained from those fed with leaves purchased from cultivators were for the most part healthy—a fact which clearly points to the perniciousness of the system, prevalent among rearers, of manuring their mulberry plantations with refuse from the rearing house, thus spreading contagion. Mr. Keighly's success, the Committee think, may be inferred from the great demand for his seed among the local silk-rearers.

His system, however, it is now reported by Mr. Marshall, a silk merchant thoroughly acquainted with Pasteur's system, to whom Mr. Keighly's system has been explained, cannot be relied upon as a safe one for the detection or eradication of pebrine.

Insects injurious to crops.

96. During the year under report numerous specimens of insects injurious to agricultural crops were obtained from district officers and forwarded to Mr. E. C. Cotes of the Indian Museum for examination, and with a view to his suggesting means of mitigating the injury caused by them. Mr. Cotes has embodied all the information supplied to him in his notes entitled "Notes on Indian Insect Pests" and "Notes on Indian Economic Entomology."

Locusts.

97. Since the issue of my annual report for 1889-90, locusts are reported to have visited the following places, viz., the Joypore Government estate, Rungpore, Titaghur and Sodepore in Barrackpore, Dinagepore, Bogra, Howrah, Dacca, and Furreedpore, during the months of November and December 1890. The Manager of the Joypore estate reports that swarms of locusts passed through that estate and damaged vegetables and the mash-kalai crop; the Collector of Rungpore that a flight of locusts settled on the lands adjacent to the river Tista in the district, and did immense damage to the crops; Mr. Bhupal Chandra Basu that swarms of locusts appeared in Barrackpore, Titaghur, and Sodepore, and ate up everything green that they could find in their way; the Collector of Dinagepore that locusts did some damage in Patnitola police-station; the Collector of Bogra that a swarm of locusts passed through the district, and did some damage to the rabi crops and trees, but they did not touch the standing rice. The Deputy Collector of Howrah reports that locusts attacked the arhar crops; the Collector of Dacca that flights of locusts passed over Baghia and adjacent mouzahs in the jurisdiction of thannah Kapasia, and ate up the standing crops, such as chillies, mustard, kalai, and teel. Again, during the months of January, February, March, April, May, June, and July 1891, locusts are reported to have visited the following places, viz., Pubna, Burdwan, Midnapore, Bankoora, Hooghly, Chupra, Palamow, Joypore, Chybassa, Rampore Beauleah, and Beerbhoom. The Collector of Burdwan reports that in the Sudder subdivision of his district the rabi crops were wholly destroyed by the locusts. In thannah Satgachia partial damage was done, and in thannah Raneegunge about three-fourths of the rabi crops were injured; but the winter rice crops were not touched. In Bankoora the extent of injury done to the rabi crops was estimated at two annas for the whole district. In the district of Midnapore the Collector reports that locusts visited 26 villages in the Garbetta thannah and 12 villages in the Ghattal subdivision, and damaged the crops, wholly or partially, of about 4,700 bighas of land under indigo, pulses, mustard, and rabi crops. The Collector of Hooghly reports that in the Serampore, Sudder, and Uluberia subdivisions, locusts rested principally on large trees, and did little or no damage to crops. The Collector of Sarun reports that small flights of locusts were seen at Banerpore thannah travelling eastward, but no great damage was done. The Subdivisional Officer of Palamow reports that a flight of locusts went through the subdivision, passing over Daltongunge. The locusts in the course of their flight settled on trees and on the fields, but did not destroy any of the important crops. Siris trees only were completely denuded of their leaves by them. The Collector of Cuttack reports that a flight of locusts passed over Jajpore, but they did not alight there. The District Superintendent of Police, Singbhoom, reports that an immense flight of locusts passed over the town of Chybassa; the Collector of Rajshahye that a flight of locusts passed over Rampore Beauleah, but they did no serious damage. The Collector of Beerbhoom reports that a flight of locusts passed over Rampore Haut, Deebragpore, Ilambazar, Sakeelipore station, Rajnugger, and Sainthia, but no appreciable injury was caused by them to the crops. Flights of locusts were also seen in Calcutta in February last. All the reports received on the subject were forwarded to Mr. E. C. Cotes of the Indian Museum for examination. He reports that the specimens of the locusts supplied to him

are "*Acredium Peregrinum*," and that the flights are stray ones which have found their way into Bengal from the North-Western Provinces, chiefly through the Central Provinces. In Bengal they are in a climate totally unsuited to them, and there is no fear of their doing any great damage. Two notes on "Locusts in India" and one note on the "Locusts of North-Western India," by Mr. Cotes, were received through the Local Government and circulated to all Commissioners of Divisions, district officers, and managers of Government and wards' estates.

CHAPTER V.

AGRICULTURAL EXPERIMENTS, INCLUDING FARMS.

98. Agricultural experiments are now being carried on in Bengal in three small experimental farms—at Dumraon, Burdwan, and Seebpore, and in some Government, wards' and private estates. Mr. Bhupal Chandra Basu is in charge of the farms at Dumraon and Seebpore, and the farm at Burdwan is under the supervision of Mr. Nagendra Nath Banerji.

Dumraon Farm.

99. The experimental crops grown last year in the Dumraon Farm were winter paddy, wheat, potatoes, khesari, and ground-nuts. Sugarcane and maize were also cultivated, but were destroyed by the abnormally heavy and continuous rainfall of the last *bhadoi* season.

Winter paddy.—The experiments made with this crop were designed to test the comparative merits (*a*) of different manures applied to transplanted paddy, (*b*) of different manures applied to broadcasted paddy, and (*c*) of deep and shallow ploughing. From Appendix E it will be seen that with transplanted paddy a mixture of crude saltpetre and linseed cake gave the heaviest outturn of grain and straw, and the ashes the next heaviest outturn. The net increase in profit obtained from these manures was Rs. 6-11-10 and Rs. 12-1-4, respectively, per acre. With broadcasted paddy cowdung gave the largest outturn. Crude saltpetre, which gave the best results of all the manures applied to this crop in previous years, failed to produce any increase in outturn over the unmanured plot. The failure is attributed to the saltpetre having been washed off by the heavy rains which fell last season.

Ploughing by means of the Seebpore soil-inverting plough, to a depth of 4 to 5 inches, resulted in an increase in outturn of 24 seers of grain and 3 maunds 20 seers of straw, per acre, over the shallow ploughing with the country plough. While the cost of cultivation was the same in both cases, there was a net increase in profit of Rs. 2-0-6 per acre in favour of deep ploughing. In previous years deep ploughing resulted in an increased profit over shallow ploughing, the increase having been Rs. 5-9-7 in 1886, Rs. 2-1-11 in 1887, Rs. 2-14-5 in 1888, and Rs. 7-9-7 in 1889.

Wheat.—The experiments with wheat were designed to test the comparative merits (*a*) of deep and shallow ploughing, (*b*) of different manures, (*c*) of irrigation from canal and well water, and (*d*) of the Mozuffernagar and the local varieties of wheat.

(*a*) With wheat sown alone deep ploughing gave an increase in yield of 30 seers of grain and nearly 1 maund 20 seers of straw, and an increase in profit of Rs. 2-2-6, per acre, over shallow ploughing; but with a mixed crop of wheat and gram the yields from deep and shallow ploughing were the same. Similar results were obtained in the previous year.

(*b*) Experiments designed to test the merits of different manures applied to wheat were made last year on a new and simplified plan. From Appendix E it would appear that crude saltpetre, by itself in plot 36B, and in combination with ashes in plot 39B, gave the largest outturn of grain and straw. In this respect the results confirmed the experience of previous years as to the value of saltpetre as a manure for wheat.

(*c*) Irrigation from well water gave an increase in outturn of 37 seers of grain and of 1 maund 21 seers of straw over canal irrigation; but the value of increased yield did not pay for the extra expense of irrigating from well water as compared with canal irrigation.

(*d*) It was stated in the last annual report that the Mozuffernagar variety of wheat had been deteriorating by continuous cultivation in the Dumraon Farm. Last year fresh seed was imported from Mozuffernagar in the North-West Provinces, but the crop gave a much smaller outturn than either Buxar or the local red, and the grain was also of inferior quality.

Potatoes.—The experiments in this crop were designed to test the relative merits (*a*) of different manures and (*b*) of the country variety of potatoes as compared with an acclimatized English variety imported from Naini Tal. The outturn obtained from the application of the different manures is shown in Appendix E. The chief lesson which the experiment indicates is the great value of green manures. Plot No. 10, which was green manured with hemp and subsequently dressed with 6 maunds of bonemeal, gave the heaviest outturn; plot No. 9, which had been green manured with hemp alone, gave the next heaviest outturn and the largest net profit. A heavy and profitable outturn was also obtained in plot No. 8, which was green manured with *sawan* grass. The application of 12 maunds bonemeal in plot No. 6 caused an increase in outturn, amounting to only 8½ maunds, over plot No. 5, which had received no manure; and the addition of 6 maunds of bonemeal to green manuring in plot No. 10 gave an increase of only 9 maunds 15 seers as compared with the outturn from green manuring alone in plot No. 9. The increased outturn thus obtained was not sufficient to cover the cost of the bonemeal applied to plots Nos. 6 and 10.

The two varieties of potatoes, of which the merits were compared, were the Naini Tal and the country red variety, locally known as the Bettiah. The results obtained last year were decidedly in favour of the Naini Tal seed, which yielded 121 maunds per acre, against 96 maunds 8 seers yielded by the country red. The Naini Tal, as said before, is an acclimatized variety of English potato. Another English variety acclimatized at Darjeeling had been grown in previous years, and proved superior to the country variety. The potatoes grown from Naini Tal seed were in great demand among Europeans at Dinapore and Buxar, and were sold last year at Re. 1-8 per maund, against 14 annas per maund realized for the Bettiah potatoes.

Khesari.—*Khesari* pulse was sown with the standing paddy in the experimental plots. The result was that the manures which had yielded the largest outturn of paddy also gave the largest outturn of *khesari.* These were cow-dung and ashes used on broadcasted paddy, and a mixture of saltpetre and linseed-cake on the transplanted paddy.

Ground-nuts.—Ground-nuts were grown on a small plot of land, and were expected to yield a good outturn, but the nuts, when almost ripe, were eaten up by rats. In the previous year the crop gave a good outturn and yielded a net profit.

The Manager of the Dumraon Raj has recently placed about 30 acres of land under Mr. Bhupal Chandra Basu's management, with a view to ascertain whether the improvements suggested by the results of previous years' experiments will prove remunerative when applied to a farm of moderate size. The cultivation of this land under Mr. Basu's supervision begins in the present season.

Seebpore Farm.

100. The crops which were experimented with in the Seebpore Farm during the year were jute, aus paddy, fodder-grasses, sugarcane, potatoes, wheat, barley, oats, ganja, and *ulat-kambal* (*Abroma augusta*). The experiments with aus paddy, wheat, and barley were designed to test the effects of certain manures; but the results hitherto obtained from these experiments are anomalous and of no value. The results of experiments with jute, fodder-grasses, sugarcane, potatoes, oats, ganja, and *ulat-kambal* are briefly described below:—

Jute.—The application of 2 maunds of oilcake, valued at Rs. 3, resulted in an increase in yield of 1 maund 6 seers of jute per bigha, valued at Rs. 4-0-5, and thus yielded a net profit of Re. 1-0-5. In the previous year a net increase in profit of Rs. 4-11-6 had been obtained from the use of the same quantity of the same manure on jute. The application of two maunds of bonemeal per bigha gave an increase in outturn of 28 seers of jute, but the increase was not large enough to pay for the cost of the manure.

Fodder-grasses.—Two different kinds of fodder-grass were experimented with last year, namely, sugar sorghum and buffalo-grass (*Reana luxurians*). The excellent results which had been obtained in the previous two years from the cultivation of sorghum as fodder, were fully confirmed by the results of last year. The total outturn of fodder from 7 bighas 3 cottahs of land was 950 maunds 21 seers, or at the rate of 135 maunds per bigha; and the total cost of cultivation amounted to Rs. 65-0-6, or at the rate of a little over 1 anna per maund of fodder. The bulk of the sorghum grown last year was sold, at an average price of 2 annas per maund, to Mr. Girish Chandra Bose, a Cirencester graduate, who keeps a dairy in Calcutta, and found it profitable to use the sorghum as a substitute for paddy-straw. Mr. Girish Chandra Bose has since been, himself, growing sorghum as fodder for his milk-cows.

The cultivation of *Reana* was found to be still more profitable. The outturn of fodder was 192 maunds per bigha, and the cost of cultivation a little below 1 anna per maund. A net profit of 1 anna per maund was realized from the sale of this fodder, which was found to be much more tender than sorghum, although not so sweet, and was greedily eaten by cattle.

Sugarcane.—The experiments with this crop were designed to test the comparative merits (*a*) of different manures applied to this crop, and (*b*) of different varieties of sugarcane. It appears from Appendix F that as regards outturn the mixture of superphosphate of bones, gypsum and saltpetre gave the best results, and the application of 12 maunds of castor oilcake the next best. The first-mentioned mixture is popularly known as "Ville's normal manure." From the last column but one of the statement it would be seen that the canes grown with this manure were much richer in saccharine matter than those grown with the other manures, having yielded as they did 14·1 per cent. of sugar, against 12·4 per cent. obtained with other manures. Eight distinct varieties of sugarcane were grown in small plots in the Farm. The experiment with these varieties brought into prominence the superiority, in productiveness, of the "Saharanpur red" variety as compared with the "Samsara" canes grown about Calcutta. It would appear from Appendix F that the Saharanpur red yielded an outturn of 26 maunds 10 seers of *gur* per bigha, against 23 maunds 30 seers yielded by the best plot of Samsara cane in the Farm.

Potatoes.—The experiments with potatoes made last year confirmed the experience of the previous years as to the value of castor oilcake as a manure for this crop. The application of 8 maunds of castor oilcake, valued at Rs. 15-9 per bigha, resulted in an increase in outturn of nearly 25½ maunds of potatoes, valued at Rs. 38-4. The application of 4 maunds of bonemeal per bigha, valued at Rs. 9-2, also gave an increase in outturn of nearly 11 maunds of potatoes, valued at Rs. 16-8.

Oats.—The experiment with oats was intended to test the suitability of this crop to the climate of Lower Bengal. The results last year, as well as in the previous year, were very satisfactory. Notwithstanding the unfavourable character of the last rabi season, the average outturn of the crop was 6 maunds 24 seers 9 chittacks per bigha, or nearly 20 maunds per acre. Oats were found to require much less care than wheat and even barley, and gave a larger outturn.

Ganja.—The object of the cultivation of this crop in the Seebpore Farm was to ascertain the average outturn, and by comparing it with the average reported outturn obtained in the ganja-growing tract in Rajshahye, to judge whether the yield reported from Rajshahye is less than the actual outturn, a portion of which, it is feared, is smuggled. The outturn obtained last year in the Seebpore Farm was 4 maunds 16 seers 7 chittacks from 11 cottahs of land, that is, at the rate of 8 maunds 12½ chittacks per bigha, against 4 maunds 15 seers 12 chittacks, which is the highest reported average outturn per bigha in Rajshahye since 1885-86. It would be premature to form an opinion on such limited *data* as to the prevalence of smuggling on a large scale in Rajshahye. The cultivation of ganja in the Farm must be carried on for some years before sufficient materials can be had for forming a conclusion as to the average outturn per bigha. Even then the difference in the conditions of climate and soil between Rajshahye and Seebpore will have to be taken into consideration.

Ulat-kambal.—As in the previous year, the results of the cultivation of this wild fibre plant were not favourable, an outturn of 1 maund 20 seers only of

fibre having been obtained per bigha. The fibre is of good quality, but the largeness of the leaves does not allow the plants to grow thick enough to yield a sufficient quantity of it.

Burdwan Farm.

101. During the year experiments were made in Burdwan with the following crops :—Sugarcane, jute, fodder-grasses, maize, paddy, potatoes, cotton, wheat, oats, barley, gram, peas, and lentils.

(1) *Surgarcane.*—The sugarcane experiments on the Farm were made with a view—

(*a*) to test the effects of different kinds of manures.
(*b*) „ „ of *ratooning*.
(*c*) „ „ of trenching and sowing in the ordinary country method in lines.
(*d*) „ „ of bonemeal on the *Samshara* and *Red Saharanpur* varieties.

(*a*) Manure experiments with the *Samshara* variety showed, as in previous years, that a mixture of castor-cake and bonemeal gives better results than either of these manures used alone. The plot thus manured yielded an outturn of 88 maunds 11 seers of *gur* per acre, which, valued at Rs. 4 per maund, would represent a net profit of Rs. 150 per acre, after deducting the total cost of cultivation, inclusive of the purchase of manures.

(*b*) *Ratooning* experiments made with the *Khari* variety of sugarcane showed that the outturn of sugarcane does not suffer either in quality or quantity by this method of cultivation. On the contrary, it has been found that the outturn has increased every successive year, as will be seen from the following statement :—

Field.	Year.	Outturn of *gur* per bigha.			Money value of outturn per bigha.			Loss or gain per bigha, after deducting cost of cultivation.		
		Mds.	S.	CH.	Rs.	A.	P.	Rs.	A.	P.
38	1887-88 ...	23	8	0	69	8	0	−(1	8	3)
	1888-89 ...	28	32	0	115	0	0	+(64	4	0)
	1889-90 ...	31	29	8	158	11	0	+(108	11	0)
	1890-91 ...	41	28	0	208	8	0	+(145	8	0)

This year's outturn per acre in the above field in the third year of *ratooning* represents a money value of Rs. 625-8 and a net profit of Rs. 436-8 per acre, and compares most favourably with the money value of a good average crop cultivated on the ordinary system, which seldom exceeds Rs. 350 per acre.

Ratooning experiments in two other fields also showed an increased yield in the second year of harvesting.

It may be noted further that, although the yield increases by *ratooning*, the actual cost of cultivation is diminished, as the cost of planting is saved, as well as that of several ploughings. Then there is the additional advantage that *ratooned* canes give an early crop, which is a consideration worthy of attention, as the price of *gur* diminishes with the advance of the sugarcane season. The raiyats of the neighbourhood have come to understand the benefits of *ratooning*, and have begun cultivating sugarcane on this system with the object of putting the value of it the test on their own fields.

(*c*) Trench sowing according to the Mauritius system gave an increase of 10 maunds of *gur* per bigha over the ordinary country method prevalent in the neighbourhood, of sowing in shallow furrows.

(*d*) The result of the experiment to test the relative merits of *Samshara* and *Red Saharanpur* canes was in favour of the *Samshara*, which gave six maunds more of *gur* per bigha than the red, representing an additional net profit of Rs. 24 per bigha.

Gur.—The *gur* manufactured on the Farm was pronounced by dealers, confectioners, and cultivators, to be decidedly superior to any that can be had in Burdwan, being of a larger grain and of lighter colour; and it accordingly fetched

a higher price than the ordinary *gur* of the market. Some of it was converted into sugar by the turbine, yielding 20 $\frac{20}{23}$ seers of sugar per maund of *gur*.

(2) *Fodder-grasses.*—The following fodder-grasses were sown on the Farm:—*Sorghum, yellow cholum, white cholum,* and *reana luxurians.* The *sorghum* was manured with bonemeal. The increase in yield thus obtained more than covered the enhanced cost of cultivation due to the purchase of the meal. The results showed that fodder-grasses can be raised at a nominal cost of two to three pice per maund, and are likely to prove profitable crops in Bengal.

(3) *Paddy.*—The largest outturn of paddy was obtained from bonemeal and saltpetre, the plots manured by them yielding respectively 10 maunds of grain and 13½ maunds of straw and 10 maunds of grain and 14⅕ maunds of straw. The enhanced cost of cultivation, due to the purchase of the manures, was in both instances covered by the increased value of the outturn.

(4) *Potatoes.*—Experiments were undertaken with the potato crop with a view to ascertain the comparative merits of different manures on Naini Tal and country potatoes, and to contrast the merits of these two varieties when subjected to the same treatment both as regards cultivation and manures. With Naini Tal potatoes it was found that a liberal manuring of 100 maunds of cowdung, 4 maunds of bonemeal, 2 maunds of castor-cake, and 25 maunds of ashes gave an outturn of 62 maunds 33 seers per bigha, or 15,078lbs. per acre, with a net profit of Rs. 74 per acre.

Cowdung and bonemeal gave a larger yield than either cowdung alone or bonemeal alone; a mixture of cowdung and castor-cake yielded a better outturn than either of these manures used separately.

In testing the comparative merits of Naini Tal and country potatoes, it was found that the outturn of the former, though subjected to exactly the same treatment as the latter, was higher by 21 maunds and 15 seers.

(5) *Cotton.*—The Nankin variety of cotton gave a larger yield than the American, the outturn of the former being 487½lbs. per acre, and that of the latter 360lbs. per acre.

(6) *Rabi crops.*—As was the case in nearly all parts of Bengal, the rabi crops of the Farm were seriously affected by the abnormally wet and stormy weather of March.

(*a*) *Wheat.*—The wheat crop previous to the heavy rain in March looked most promising, but the wind and hail in that month seriously affected the outturn. The experiment, however, showed that the bonemeal plots yielded an increase of 81 seers of grain and 1 maund 31 seers of straw per bigha over the unmanured plots, and this increase more than paid the cost of manure.

(*b*) *Oats.*—The oat experiment showed that cowdung, applied at the rate of 50 maunds per bigha, gave an increased outturn of 37 seers of grain and 1 maund 15½ seers of straw per bigha. The total cost of cultivation per bigha, inclusive of manure with cowdung, was Rs. 7-4, and for the unmanured plot Rs. 5-6, and the money values of the outturn per bigha of these plots were, respectively, Rs. 12-9 and Rs. 9-1; so that the increase in the net profit of the plot manured with cowdung over the unmanured plot was Rs. 4-14 per acre.

(*c*) *Barley.*—Manuring with saltpetre and cowdung increased the outturn both of grain and straw; but the cost of the manures used being as much as Rs. 4-15 per bigha, owing to the high price of saltpetre, which costs in Burdwan Rs. 11-12 per maund, it was found that the net profit in the manured and unmanured plots was practically the same.

(*d*) *Gram.*—The experiment with gram was made to test the effects of cowdung and bonemeal. It was found that the bonemeal plot gave a net profit of Re. 1-2-5 per bigha, the cowdung plot a net profit of annas 9-2, while in the unmanured plot a loss was incurred of Rs. 2-1-11. The experiment, although affected by the rains, which reduced the yield of all the crops considerably, yet clearly points to the good effects of bonemeal as a manure for this crop.

Experiments were also made with peas and lentils, but these crops were so badly damaged by rain which fell while they were being harvested in March, that no stress whatever can be laid on the results obtained with them.

102. *Potato cultivation in the Darjeeling Hills.*—Experiments in potato cultivation in the Darjeeling Hills were again made during the year under report, but

they were as fruitless as those made in previous years. As usual, the crop was reported to be in a healthy condition until the beginning of June, when blight made its appearance. The only lesson which has been brought about by potato experiments in Darjeeling is that by liberal manuring the crop may, to a large extent, be strengthened to resist the destructive action of blight. In one plot treated with a chemical manure, and in another with decomposed town-sweepings, the produce amounted respectively to 15 and 11 times the quantity of seed which had been planted. A new remedy for potato disease, consisting in spraying the crop with a very diluted solution of sulphate of copper, has recently been discovered in Europe; it is intended to try this in the next season.

The utilization of bones as manure.

103. It was remarked in the last annual report (page 28) that until bone-meal could be offered at cheaper rates than those now prevailing, there was no hope of its general adoption in native agriculture. Several means were tried during the year to effect this object. A trial was made in the Seebpore Farm with a view to ascertain the cost of crushing bones with a small English bonemill capable of being driven by hand-power, as compared with the native *dhenki*. The results were in favour of the *dhenki*, which turned out one maund of fine bonemeal at a cost of Re. 1, against Re. 1-2-3 by the English mill. It was expected that the cost of crushing bones by the *dhenki* would amount to about 10 annas per maund; and including the price of bones, which may be obtained in many districts for the mere expense of collecting them, that the total cost of bonemeal would not exceed Re. 1-4 per maund. It was arranged, in consultation with the Inspector-General of Jails, to start bone-crushing, with the *dhenki*, by Mahomedan convict labour, as an experiment, in the Julpaiguri Jail. Operations were commenced in the latter part of August, but were frequently interrupted because of the paucity of convicts eligible for the work.

Up to the end of the year, the total outturn was about 66 maunds of fine, and 27 maunds of rough, crushed meal. The raw bones were bought from Chamars at the contract rate of 6 annas per maund, and the cost of crushing at first averaged 13 annas 9 pies per maund of fine meal. Since the close of the year a regular supply of Mahomedan convicts has been obtained, and the cost of crushing has been reduced to 9 annas per maund. It is now possible to offer bonemeal at Julpaiguri at Re. 1 per maund. Of the 66 maunds of fine meal produced up to the end of the year, 30 maunds were sold to jotedars and 32 maunds to a European planter and European officials at Julpaiguri. Since the close of the year, 24 maunds have been sold to jotedars. The whole of the 54 maunds of bonemeal sold to the jotedars has been applied by them as manure to jute. The result will be carefully watched and recorded.

Fermentation was one of the means suggested to soften raw bones, and thus render the crushing of them comparatively easy and cheap. Experiments in this direction were made in the Burdwan and Dumraon Farms, and in one of the Government villages in Sasseram. The bones were buried in alternate layers with dung, ashes, or lime and covered with earth. After a lapse of about six months they were dug up and were found to have become comparatively soft and brittle. The manure, as thus prepared, was used with good effect, in the Burdwan Farm, on a plot of land newly broken up and sown under potatoes. The cost of fermenting and crushing the bones in this way amounted to Re. 1-2-5 per maund.

Maize Fodder.

104. In accordance with the orders of the Government of India, arrangements have been made in the Seebpore and Burdwan Farms to try, in the present bhadoi season, the method of curing maize fodder by removing all the leaves and tops before the maize is ripe for harvesting, and then subsequently storing them in bales, recommended by Mr. Carleton of Ratgirh. The result will be noticed in the next year's annual report.

EXPERIMENTS MADE BY MEMBERS OF THE HORTICULTURAL AND AGRICULTURAL SOCIETY OF INDIA.

105. The annual report of the Society for the year 1890 has been received. The work done by the Society comes under the following heads, viz.—

(1) Silk experiments.
(2) Experiments with the cream separator.
(3) Cultivation of *Enthroxylon* Coco.
(4) Introduction of grain elevators into India.
(5) Manufacture of cocoanut butter.
(6) Tea soil analysis.
(7) Flower show.
(8) Introduction and distribution of trees, plants, and seeds.

(1) *Silk.*—At the request of the Silk Committee a small experimental station was established near the Society's garden at Alipore for the purpose of rearing silkworms from seeds selected by Mr. Nitya Gopal Mukerji. Most of the seed received from time to time gave unfavourable results, but one batch which was free from disease gave good results, as it went through five generations and showed no signs of disease. The race is reported to be hardy, and the cocoons produced were of excellent quality—superior to any obtainable in the market.

(2) *Cream Separator.*—During the early part of the year, Mr. Howman, who represented the Dairy Supply Company, Limited, of London, made the Society's office his head-quarters, and gave some exhibitions of the separating of cream and churning of butter, and made comparative trials of his and the ordinary native methods. The results were favourable to Mr. Howman's method, but in subsequent trials during the hot weather, it was found that the heat of India is a serious obstacle in the way of the adoption of the European methods. During the cold-weather months very good results were obtained by the adoption of the system demonstrated by Mr. Howman.

(3) *Enthroxylon Coco.*—As was stated in last year's report, the Society consider it has done all that is required towards the establishment of this plant in India. Small quantities of the leaf have recently been exported, and have realized prices sufficiently good to render cultivation of the plant a paying industry. The Society continues to raise plants, but now sells them at a low price, instead of distributing them gratis as heretofore.

(4) *Wheat Elevators.*—A lengthy correspondence on the subject of the introduction of the American elevator system into India, and with regard to the adulterants used with wheat, was dealt with by a Committee of members of the Society. From enquiries instituted by them it appears that a regular business for the collection and preparation of adulterants of wheat exists in Calcutta, where materials collected from the sweepings of godowns, millers' works, &c., are sold for admixture with wheat under the standard "refraction" as well as for other more legitimate purposes. A full report on this subject was submitted by me.

(5) *Cocoanut Butter.*—The Society made a trial with fresh cocoanuts, and butter was prepared with most simple appliances. It was found, however, to deteriorate very rapidly and to turn rancid in warm weather.

(6) *Tea soil Analysis.*—An arrangement in respect of the engagement of a special chemist for the analysis of tea soils, plants and manures was finally come to during the year under review, and the Society engaged the services of an agricultural chemist. This gentleman (Mr. M. K. Bamber) has arrived in this country, and is now in Assam. On his return to Calcutta he will undertake the analysis of tea soils, &c.

ZOOLOGICAL GARDENS.

106. These Gardens are under the management of a President, Honorary Secretary and Treasurer, and *ex-officio* and ordinary members. Funds are derived from donations and subscriptions, admission fees, *fête* receipts, rent, sale of Garden animals, and rates levied on visitors for use of Garden property, supplemented by a liberal grant from the Government of Bengal. During the year 1889-90 one member and five life-members were enrolled.

The donations and subscriptions amounted to Rs. 1,098, the Government contribution for the year was Rs. 19,504-1-8, and the total net receipts Rs. 37,630. The total expenditure was Rs. 46,285, leaving a deficit of Rs. 8,655. The number of visitors who paid entrance fees was 109,569, against 111,573 in the previous year, but this number is exclusive of a large number of students and children under eight years of age, who were admitted free of charge. It is stated that the Garden continued to maintain its popularity with the students and teachers of the various schools and colleges of Calcutta and its suburbs.

Cost of Agricultural Experiments.

107. The total net cost to Government of agricultural experiments and enquiries conducted under the supervision of the Agricultural Department, and of collection of agricultural statistics and information during the year, inclusive of the cost of implements and grains, &c., was Rs. 9,748, or about one-half of the Government contribution to the Zoological Gardens.

AGRICULTURAL EXPERIMENTS AND IMPROVEMENTS IN WARDS', GOVERNMENT, AND PRIVATE ESTATES.

108. The following is an abstract of the account received from local officers of agricultural experiments undertaken and improvements made during the year in wards', Government, and private estates:—

(1) BURDWAN DIVISION.—*Private Estates.*—Buxar wheat was tried in certain private estates in the Raneegunge subdivision, but failed owing, it is said, to the raiyats' want of knowledge of the proper method of cultivation, and to want of such heavy dews as prevail up-country.

A few experiments were tried by raiyats in the neighbourhood of the Burdwan Farm.

(*a*) *Paddy.*—Two Mahomedan raiyats, who had been supplied with bonemeal by this Department, obtained very good results with their paddy crop. The increase per bigha in each case from the use of the manure amounted to about 4½ maunds of grain and 400 bundles of straw, representing a money value of Rs. 5 per bigha.

(*b*) *Sugarcane.*—The method of ratooning sugarcane having been seen and approved of by raiyats in neighbourhood of the Burdwan Farm, three of them expressed a wish to adopt that method, provided they were given the assistance of the Department. Arrangements were accordingly made to supply them with cuttings.

(2) *Government Estates.*—Experiments with bonemeal were made during the year in several villages of Government estates in the Hooghly district, but the results were not satisfactory. Three Seebpore ploughs were supplied to the raiyats of these villages, and were regularly used by them in preparing their lands for potatoes and sugarcane. An experiment in the cultivation of Buxar wheat was successful in this place. The Collector thinks that the results obtained have prepared them for further attempts. In the Contai subdivision in Midnapore a fresh attempt was made to grow long-stemmed paddy in estates under direct management, but the plants unfortunately again died through drought, and the raiyats are unwilling to renew the experiment.

(3) *Wards' Estates.*—The following are the results of experiments undertaken in the Midnapore district in the estates of Malighati, Sujamutha, Turka, Basudebpore, Moheshpore, Nyagram, and Belluria:—

(i) *Malighati.*—Manure experiments were made with manures on Naini Tal potatoes with the result that bonemeal increased the outturn of the manures over the unmanured plots by 6¼ maunds, oilcake by 5 maunds, and cowdung by 3 maunds and 30 seers. In all cases the extra cost incurred in the purchase of the manures was recouped by the increased outturn. The highest outturn was 21 maunds 10 seers. The Manager reports that a larger outturn would have been obtained had not incessant rainfall, during the latter end of October and the beginning of November, interfered with the sowing of the tubers in proper season.

(iii) *Turka.*—The cultivation of potatoes was tried by the Manager and also by raiyats to whom seed potatoes had been distributed. The average outturn was 12 maunds 7 seers a bigha. The Manager attributes this unsatisfactory result to the inferiority of the soil of the estate, and to heavy rains during the sowing and harvesting seasons which seriously affected the outturn.

(iv) *Basudebpore.*—Experiments were carried on with potatoes and Buxar wheat.

Potatoes were sown in two plots in different parts of the estate. In one plot, measuring half a bigha, the outturn was 32 maunds per bigha, and the net profit, after deducting the total cost of cultivation and manures, Rs. 24-7-6. In the other plot the crop was destroyed by whiteants, although precautions were taken to ward off their attacks. Seed was also distributed to 22 raiyats, who cultivated the crop with varying degrees of success, the highest outturn being 50 maunds per bigha, a result which may be considered satisfactory.

Wheat was sown in two plots in different parts of the estate by the Sub-Manager. In the one case a net profit was obtained of 10 annas on an outturn of 2 maunds per bigha, and in the other a loss was sustained of Re. 1-0-6, the outturn being only 1 maund 10 seers per bigha. Seed was also distributed among 17 raiyats; the outturn per bigha varied from $1\frac{1}{2}$ to 3 maunds.

(v) *Moheshpore.*—The cultivation of potatoes was tried in the zemindar's garden, but the crop yielded a poor outturn. Cultivation of potatoes was also tried by numerous raiyats to whom seed was distributed. The outturn obtained by them is reported to have varied from $1\frac{1}{2}$ to 40 maunds per bigha.

The cultivation of wheat was not generally successful here, though one raiyat obtained 4 maunds per bigha, which may be regarded as fairly satisfactory.

(vi) *Nyagram.*—Wheat failed, while potatoes gave an outturn of $10\frac{1}{2}$ maunds per bigha.

(vii) *Belluria.*—The cultivation of potatoes in this estate gave satisfactory results, the average outturn obtained by the raiyats being 40 maunds per bigha.

Gram and castor-seed were also raised with success, the outturn of the former being 5 maunds and of the latter 7 maunds per bigha.

(4) PRESIDENCY DIVISION.—In the 24-Pergunnahs the cultivation of *boro* paddy, which was introduced into the Diamond Harbour subdivision by the Subdivisional Officer after the floods of 1888, was continued. A native gentleman of Halisahar in the district purchased a Seebpore plough and a Barakar chain-pump last year, and is reported to have used them in his own cultivation. Some experiments were also made by him and his tenants with bonemeal applied to winter paddy, but the increase in outturn of grain obtained therefrom was, it is reported, only nominal.

In Jessore, the Subdivisional Officer of Jhenidah imported 50 maunds of Buxar seed wheat for experimental cultivation in his subdivision, and sold the greater part of it, in small quantities, to numerous cultivators; but owing to the unfavourable character of the season the cultivation was not successful. Some experiments undertaken by a native gentleman in this district were very successful. One was the cultivation of potatoes, which was before unknown in this district. The outturn of potatoes obtained was 45 maunds per bigha, locally valued at Rs. 2-8 per maund. In consequence of the success of this experiment, many cultivators of the neighbourhood have applied to this Department for seed potatoes in the next season. Another experiment made by this gentleman was the introduction of the Seebpore plough. He purchased two Seebpore ploughs last year, and has kept them in constant use in his own cultivation in place of the native plough. He reports in high terms of praise of the efficiency of the Seebpore plough in breaking up fallow and grass lands.

In Moorshedabad the Beheea sugarcane mills came into use in the Lalbagh subdivision, and they were much appreciated by raiyats. Two Seebpore ploughs were also in use by *khas mehal* raiyats at Lalbagh. The ploughs are reported to till a larger quantity of land than the country ploughs; but the raiyats have not yet been able to form a final opinion as to their usefulness. The cultivation of Buxar wheat was tried in some of the mehals in the Cossimbazar Ward's Estate, but the crop was affected with mildew and failed. Buxar wheat was also tried in Jungipore with unsatisfactory results.

No agricultural experiments were undertaken in Nuddea and Khulna. Some improvements were made during the year in Government estates in the 24-Pergunnahs, and in the Sudder, Lalbagh, and Jungipore subdivisions in Moorshedabad; but none of these were "agricultural improvements" in the proper sense of the term.

(5) RAJSHAHYE DIVISION.—*Government Estates.*—In the Jaypore Government estate in Bogra, *sisoo* and other valuable trees, which had been planted in former years, were maintained during the year at a cost of Rs. 72-1-1. Some of the trees, however, appear to have died out during the rains. In order to facilitate the reclamation of a jungle near Balapura, covering an area of over 100 bighas, an old tank was repaired at a cost of Rs. 300. A few *Boonás* have already settled at the place, and it is expected that the whole of the area will be brought under settlement within a few months. A market was established at Rukempore, and a new tank excavated there at a cost of Rs. 1,000. The only improvement made during the year in the Government estates in Rungpore was the excavation of a tank at Bhotiamehal by the farmer, Babu A. N. Ray of Cossimbazar.

In the Government estates of the Western Dooars in Julpaiguri, the experiments of the previous year were renewed. The cost of these experiments was met out of the Jotedars' Union Fund, which had been started in the previous year by the Settlement Officer, Mr. Donald Sunder. The experiments which were tried and the results are briefly described below:—*Improvement of potato cultivation.*—One hundred maunds of Naini Tal seed potatoes were supplied by this Department and distributed by Mr. Sunder among the jotedars. The results were fairly satisfactory. The potatoes grown from the Naini Tal seed were much larger than the country potatoes, and also superior in quality and yield. The jotedars appear to be satisfied with the results, and desire to grow the Naini Tal variety in future. *Vegetable cultivation.*—Seeds of various country and European vegetables were also supplied by this Department, and distributed *gratis* among the jotedars. The results were very satisfactory, and it is believed that the cultivation of vegetables, which had been unknown before, has now been fairly introduced in the Dooars. It is desirable to carry on the distribution of these seeds for a few years in order to ensure permanence of cultivation. *Buxar wheat.*—The cultivation of wheat in the Dooars was a failure: the humid climate and the sandy soil are not suited to its cultivation. *Introduction of bonemeal.*—Experiments in the use of bonemeal as a manure for jute were generally successful. In one instance the application of 1½ maunds of bonemeal, valued at Rs. 3, on half an acre of land resulted in an increase in outturn of 4 maunds 28 seers 9 chittacks of jute, valued at nearly Rs. 14. Experiments are being made in the present season with bonemeal as a manure for jute on a larger scale. *Improvement of cattle.*—With a view to improve the local breed of cattle, two bulls were imported during the year from Durbhunga. *Improved sickles.*—Several dozens of sickles made to English pattern with slight modifications were distributed by the Settlement Officer among the jotedars who took them willingly enough, but on the whole prefer their own cheaper sickles.

(6) *Private Estates.*—Numerous experiments were undertaken by Raja Sasi Sekhareswar Ray of Tahirpore in his estates in the districts of Rajshahye, Bogra, Maldah, and Moorshedabad. Among these were (*a*) the cultivation of English vegetables; (*b*) the cultivation of the sun flower, the seeds of which produced a large quantity of oil of strong odour: the stems were used as fodder; (*c*) the cultivation of *Occinium basilicum*, a species of sweet basil or *tulsi*, which is believed to be a protection against malarial fever; (*d*) the cultivation of Chinese mulberry as a substitute for the indigenous variety; (*e*) the use of bonedust which was applied to sugarcane, but was found to be inferior to cowdung and ashes; (*f*) and the use of an insecticide consisting of kerosine oil, milk and water, which was applied with perfect success to garden vegetables infested with a species of red-coloured insect. *Malis* and other raiyats have since taken to the use of this insecticide. Raja Sasi Sekhareswar Ray is known to take a keen interest in agricultural matters. He publishes a monthly periodical called the *Silpa-Krishis Patrika*, and distributes it free among his tenantry. A small pamphlet containing instructions in simple Bengali on the rearing of silkworms has been published by him, and a few

hundred copies have been distributed *gratis* among his tenants and those of neighbouring zemindars.

(7) *Wards' Estates.*—In the Maldwar Ward's Estate in Dinagepore no improvements were effected, or experiments carried out, during the year, beyond the distribution of a maund of Buxar wheat seed among the raiyats, and the use of the Beheea sugarcane mills in some of the villages. The Manager reports that the cultivation of the wheat proved a success, and interested the raiyats so much that they wish to try wheat this year again.

In the Sunkerpore Estate in Dinagepore, Buxar wheat was tried sown by the raiyats, and some also in the estate gardens; but the result of the experiment was unsatisfactory. The Manager attributes the failure to the heavy rains and hailstorm which occurred in the month of February last, and partly to the unsuitableness of the soil. Beheea cane mills are said to have been extensively used by the raiyats of the estate. English vegetables are reported to have been grown in the estate gardens with much success. There are plantations of valuable timber such as *sisoo*, teak, and mahogany, as well as of fruit trees in the estate, which were maintained during the year.

In the Haripore Estate nothing was done beyond the trial, on a small scale, of the Buxar wheat in the estate garden only, and the cultivation with success of some English culinary vegetables. Two patent ploughs are said to have been tried in the estate garden. The raiyats, however, considered them too heavy for ordinary bullocks.

There were no agricultural improvements and experiments undertaken in the Dighapatiya Ward's Estate, the only estate under the Court's management in the district of Rajshahye.

In the Burdhonkotee Ward's Estate in Rungpore much progress was made towards reclamation of jungle. The Beheea sugarcane mills are said to be in great demand all over the estate, but the Manager reports that the mills supplied by Messrs. Renwick and Company are somewhat defective, and suggests that they ought to be replaced by improved mills. During the year 5 maunds of Buxar wheat are reported to have been distributed among the raiyats for cultivation. The experiment was successful. English vegetable seeds were also distributed to a number of leading tenants who are said to have succeeded in growing them tolerably well. A plantation of graft-trees was opened at Basudebpore, a mehal belonging to the estate.

(8) Dacca Division.—No agricultural improvements were made during the year in any of the districts in this Division. In the Government estates in Furreedpore an attempt was made to introduce the cultivation of potatoes and sugarcane, but proved unsuccessful.

(9) Chittagong Division.—No agricultural experiments or improvements were made in the Government or Wards' estates in the district of Noakhalli. In the Serail Ward's Estate in Tipperah, experiments were made with wheat, barley, linseed, tobacco, and potatoes; but, with the exception of potatoes, all these crops were destroyed by insects and heavy rain in February. The potatoes were saved by handpicking, and gave a fair yield. The Sub-Manager reports that the success of the potato crop has encouraged the raiyats in the neighbourhood to try it again the next season. In Chittagong the planting of cocoanut trees, and the cultivation of potatoes, cabbage, pea, and sugarcane, were tried, but the result everywhere was, more or less, a failure.

(10) Patna Division.—No agricultural experiments or improvements were made in the districts of Mozufferpore, Durbhunga, and Chumparun during 1890-91.

In the Gya district a tube well was made for supplying good drinking-water in Government mehal Dabour, and is reported to be working well.

In Shahabad the Subdivisional Officer of Sasseram made experiments in the cultivation of potatoes and English vegetables. The potato crop is reported to have failed owing to repeated attacks of whiteants. The Egyptian date-palm is being largely tried at Nasrigunge and Deuria in Sasseram. The plants in pots in the garden of the Subdivisional Officer are doing very well, and will be transplanted during the rains. The Subdivisional Officer was furnished by this Department with a sum of Rs. 100 for making experiments

with bone manure. A large quantity of bones has been collected and pitted for fermentation. These will be powdered into bonedust which will be applied to paddy in the present season.

In Sarun 6 maunds of Buxar seed wheat were purchased for experimental cultivation by the Manager of the Mariara Indigo Factory, and 2 maunds by the Manager of the Hutwa Raj. In Hutwa the Buxar variety was found to yield a smaller outturn than the local variety of wheat.

In Patna the cultivation of Buxar wheat was tried in three villages in the estate of minor Bhagwat Narain Singh. In one village the crop entirely failed, owing chiefly to the abnormal rain and hailstorms which occurred about the middle of March last; while in the other two villages the crop yielded a poor outturn, although it was larger than that of the local variety. The cultivation of Buxar wheat has been found to pay better than that of the local variety, and is reported to have taken root in these villages.

(11) Bhagulpore Division.—In Monghyr the cultivation of Buxar wheat was tried by some of the raiyats of the Government estate Binda Diara, but the outturn was poor, as the soil was a sandy loam not adapted to the growth of the crop. The grain was also of an inferior quality. Several works of improvement were executed during the year in Bhagulpore and Purneah, but with the exception of two mahogany and mango plantations at Arrareah and Srinagar, none of them can be properly called agricultural improvements.

(12) Orissa Division.—In the Cuttack district experiments were made in the Wards' estates of Modhupore, Kanika, and Kujong, the results of which are described below :—

(i) *Modhupore.*—Experiments in the Modhupore Estate were conducted under the immediate supervision of Mr. Nagendra Nath Banerji, opportunity being afforded him, while on tour in the Cuttack district for agricultural enquiry, to see that his instructions were carried out. A cultivator was also sent over from the Burdwan Farm to advise the local raiyats. The crops experimented on were potatoes, sugarcane, wheat, ground-nuts, and cotton :—

(*a*) *Potatoes* were sown in four places. In all cases the soil was found suitable for the cultivation of this crop, which at present is grown only to a very small extent in the town of Cuttack by a few gardeners. The plots were manured with oilcake and dung, and in all cases gave a profit and more than repaid the cost of the purchase of manures. One plot manured with five maunds of oilcake gave an outturn of 31½ maunds per bigha, the average outturn per bigha being 15 maunds. The Manager reports that the raiyats learnt very carefully the method of cultivating potatoes from the Burdwan cultivator. They grew small quantities of potatoes in the corners of their fields, and it is, he says, hoped that many raiyats in the Modhupore Estate will start potato cultivation in the coming season. The quality and size of tubers, although inferior to those produced in the experimental farms, was, on the whole, very good, and was pronounced to be so by the Collector of Cuttack and others who had the opportunity of seeing and testing them.

(*b*) *Sugarcane.*—The sugarcane grown in the Modhupore Estate was found to be of very poor quality, being deficient in juice and saccharine matter. In order to effect an improvement in the cultivation of this crop by the introduction of new varieties, cuttings of the Samshara and red Saharanpur varieties were selected by Mr. Nagendra Nath Banerji, and grown in different parts of the estate. The total cost of the experiment was Rs. 111, and the money value of the outturn is estimated at Rs. 400 at the local rates. These experiments are reported to have given great satisfaction to the raiyats.

(*c*) *Wheat.*—The wheat crop was at first very promising, but owing to unseasonable weather at the time of harvesting, the outturn was considerably reduced.

(*d*) *Ground-nuts.*—The experiment with this new crop was not attended with much success. A second trial will be made to grow the crop during the present year.

(*e*) *Nankin cotton* was introduced for the first time into the estate, and did fairly well. The raiyats are much pleased with the colour of the cotton, and have expressed a wish to cultivate this variety in their own fields. Seed has been kept by the Manager for distribution.

(ii) *Kanika.*—The experiments with potatoes were more successful than in previous years. The outturn per acre was 28½ maunds.

(iii) *Kujong.*—Experimental cultivation of long-stemmed paddy was tried for the first time in the Kujong Estate in certain fields, where at present no crop can be grown, on account of the high floods which inundate these parts. Although this variety of paddy grows in soil under 10 to 15 feet of water, it is greatly damaged by the sudden rise of water and by a strong current. This occurred in mouzahs Bhanakhata, Pintha, Narainpur, and Kosoti, where the crops were swept away by high floods. Where the force of the current was not so strong, or the rise of water so sudden, the crop did better, but the outturn was below the average.

Experiments were made in the Banki Government Estate with cotton, ground-nuts, and potatoes, but were not successful, owing to heavy rains which interfered with the germination of the seed.

In the Khorda subdivision, in the Pooree district, an experiment was made in the cultivation of Buxar wheat, but the result is not stated. Several works of protection were constructed during the year in the *khas* and *jagir* mehals in the Pooree district, as well as in Balasore.

(13) Chota Nagpore Division.—The most important experiments undertaken in this Division were made in the Jheria Estate in Manbhoom under the supervision of Mr. Bhupal Chandra Basu. The experiments were in continuation of those made in the previous year. The results were as follows:—

(*a*) *Paddy.*—As in the previous year, the application of oilcake to this crop was attended by a large increase in the outturn of paddy. The application of bonemeal also resulted in an increase in outturn, but, except in one instance, the increase and did not pay for the cost of the manure. The beneficial effect of green manuring with indigo and sunn hemp was also clearly shown by the experiments of the last year.

(*b*) *Potatoes.*—In consequence of the success of the potato cultivation introduced in this estate in the previous years, there was a great demand for seed potatoes in the last season. Thirty maunds of seed were accordingly distributed among numerous tenants—mostly *Koeries*. The results were very satisfactory. At Jheria, where the cultivation was carried on by the tehsildar himself, the outturn was at the rate of 45 maunds of potatoes valued at Rs. 72. A similar outturn was also obtained at Govindpore, the head-quarters of the subdivision, where the cultivation was looked after by the Subdivisional Officer himself. The tubers were sound and of very good size. The cultivation of this important crop, which had been unknown before, appears to have already become popular.

(*c*) *Sugarcane.*—Experiments in this crop did not yield satisfactory results. An experiment was made to test the effects of bonemeal, saltpetre, and oilcake, as compared with those of dung and ashes ordinarily used in the country. The crops treated with the artificial manures showed a great improvement upon the crop treated with the country manure; but unfortunately the raiyats to whom they belonged, mixed up the crops in harvesting, and no quantitative results were therefore available. The Mauritius and the Bengal systems of planting which were tried failed owing to the ravages of whiteants.

(*d*) *Cold-weather maize.*—The Subdivisional Officer of Govindpore and the Rev. Mr. Campbell of Pokhuria made experiments in the cultivation of maize in the cold weather. The crop was grown from Canadian maize seed, which was supplied by this Department. In both places the crop grew well, and gave a good

outturn. The Subdivisional Officer thinks that if cultivation of this crop can be introduced, the crop may prove to be invaluable in the event of the failure of bhadoi maize, which is one of the chief staples of this part of the country.

(*e*) *Ensilage.*—An experiment with ensilage having proved successful in the previous year, two small silos were made during the year under review, one at Jheria and the other at Govindpore. The ensilage made last year is reported to have been even better in quality than that made in the previous year, and was eaten down to the last straw by the village cattle. The raiyats are yet unwilling to pay for the ensilage. As the ensilage is entirely composed of wild grasses, it need cost them nothing beyond their labour to prepare it.

(*f*) *Improvement of the native breed of cattle.*—A bull was imported during the year from Hissar at the instance of Mr. E. N. Baker, Deputy Commissioner of Manbhoom; but it is found that it was too heavy for the local cattle.

Besides the experiments described above, the Rev. Mr. A. Campbell of Pokhuria, in the Manbhoom district, increased his cultivation of mulberry with a view to extend sericulture which has been carried on there as an experiment for the last two years. He also tried hay-making with fairly good results.

In the Lohardugga district, the cultivation of Buxar wheat was tried in the five encumbered estates in the Sudder subdivision. The results obtained in four estates are not known; in one estate, for which a report has been received, the outturn was very poor owing to unusually heavy rainfall at the time when the crop was maturing. No experiments were made in Hazaribagh and Singbhoom.

113. The following statement shows the expenditure in Wards' and Government estates on agricultural experiments, improvements, and other works of the nature of agricultural improvements during the year, so far as can be ascertained from the Commissioners' reports:—

Divisions.	In digging tanks and wells.	In draining and irrigation.	In dams and embankments.	In planting trees.	In agricultural experiments properly so called.	In sundry works.	Total.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Dacca ...	...	...	...	...	...	...	...
Chittagong ...	...	...	...	...	...	...	...
Rajshahye ...	1,300 0 0	...	...	72 1 1	...	...	1,372 1 1
Presidency ...	...	632 0 0	1,567 15 7	...	...	312 7 10	2,512 7 5
Bhagulpore ...	149 13 6	143 11 0	1,124 10 0	200 0 0	...	...	1,618 2 6
Burdwan ...	1,747 15 6	...	...	...	614 5 9	1,421 6 6	3,783 11 9
Patna ...	...	...	...	...	100 0 0	...	100 0 0
Orissa ...	4,255 0 0	...	20,171 0 0	...	530 10 0	...	24,956 10 0
Chota Nagpore ...	...	200 0 0	2,991 3 2	...	952 2 6	...	4,143 5 8
Total ...	7,452 13 0	975 11 0	25,854 12 9	272 1 1	2,197 2 3	1,733 14 4	38,486 6 5

109. It will be seen that out of the total expenditure for miscellaneous improvements, only a small portion was spent during the year on agricultural experiments and improvements properly so called. Though something has been done during the year in agricultural experiment and improvement, yet it must, I fear, be said that many district officers do not appear to have shown themselves sufficiently alive to the importance of the subject. In many places experiments were undertaken by local officers without making any previous reference to me. I was consequently unable to exercise efficient supervision over these experiments. In estates for which proposals for agricultural experiments had been made early in the year, and the officers of this Department were able to exercise personal supervision over the experiments from the beginning, a large measure of success appears to have been achieved.

Agricultural Implements.

110. (1) *The Seebpore Plough.*—During the year 32 Seebpore wrought-iron ploughs were supplied to different parties. Of these, five were sent to the Rev. J. H. Graham of Kalimpong, two to the Superintendent of the Jail, Purneah, three to the khas mehal villages in Hooghly, one to the Subdivisional

Officer, of Govindpore, two to a native gentleman in Jessore, one to a native gentleman in the 24-Pergunnahs, and one to a native in Julpaiguri. All these ploughs are reported to have been used and given satisfaction. A native gentleman of Jessore, who purchased two ploughs for himself and two more for his raiyats, has reported very favourably on them. He is of opinion that one ploughing with the Seebpore plough is as effective as four or five ploughings with the country plough, and that the former is admirably adapted for breaking up fallow and grass land.

The Sub-Deputy Collector of Banki, who was supplied in the previous year with one Seebpore and one Baldeo plough, reports that the former worked tolerably well, but the latter did not prove useful. The Commissioner of Patna reports that the Seebpore ploughs which had been distributed in the previous year to the well-to-do raiyats of the estate of Bhagavat Narain Singh in Patna, are not well adapted to the cultivation of clay soils, and were found inconvenient to manage. Since the close of the year a trained ploughman was sent up there from the Seebpore Farm, to show the working of the Seebpore ploughs to the raiyats, who are reported to be using them in the cultivation of paddy and bhadoi crops in the present season. Mr. J. W. Crowdy, whose favourable opinion of the Seebpore ploughs was quoted in the annual reports for 1888-89 and 1889-90, now reports that the ploughs which he has purchased are worked on his own lands by his tenants, with their own bullocks, but that they themselves have not yet taken to purchasing them because of the expense. A Seebpore plough was supplied through the Director of Land Records and Agriculture, Punjab, to the Municipal Committee of Amritsar. The Secretary to the Committee reports that the plough is a good one, and has been used by him with success in parks and gardens, but the zemindars cannot be induced to adopt it.

The Seebpore plough was exhibited at the agricultural exhibitions which were held during the year at Khulna and Kurseong and at Khaliskhali in the Khulna district. At Khulna the working of the plough was approved of by the cultivators, who considered it superior to their own ploughs for breaking up high lands, but objected to its use on the score of costliness and heaviness of draught. Demonstrations of ploughing with the Seebpore plough were held in some villages in the Hooghly district, in one village in Jessore, and in one village in the 24-Pergunnahs. The cultivators who saw it at work were in every case pleased with it; some few of them have since been supplied with these ploughs at their request, and they are now being used by them.

(2) *Water-lifts.*—Four hand-power and one bullock-power Barakar chain-pumps were sold during the year by the Bengal Iron and Steel Company of Barakar, and one Barakar pump was sold to a native gentleman in the 24-Pergunnahs, who found it useful. The pump was again exhibited at Khulna last year and at a village fair in that district.

(3) *Sugar-turbine.*—Some experiments were made with this machine at the Seebpore Farm, with the result that it was found well adapted for making *dolo* or *katcha* sugar out of cane *rab*. The turbine has already come into general use in the Shahabad district through the efforts of Messrs. Thomson and Mylne of Beheea. Attempts will be made to bring it to the notice of the sugar growers in other parts of Bengal. It was found on the Burdwan Farm that with care and cleanliness and the use of defœcants like soda, a very superior quality of *rab* can be made, which can be easily converted into *katcha* sugar of good quality. The introduction of this machine is expected to bring about a gradual improvement in the present complicated process of sugar manufacture in this country.

(4) *Butter-making machines.*—It was noticed in the last annual report that the trials of the European dairy machines which had been made in the previous year by Mr. A. H. Howman and by Messrs. Bhupal Chandra Basu and Nagendra Nath Banerji, were far from being conclusive. In order to test the suitability of these machines to the climatic conditions of Bengal, a series of trials was made during the year under report in Calcutta, Jessore, Khulna, Tumlook, Ghatal, Kurseong, and several places in the Purneah district. The chief result which these trials brought out was, that while the cream separator

almost completely separated the fats from milk in all weather, hot or cold, the cream did not yield the full complement of butter at one churning, unless the temperature was below (roughly speaking) 75°F. During the cold weather, in the plains, and all round the year in the hills, and in districts bordering on the Himalayas like Purneah, it would cause a great saving in time and labour to make butter or ghee with these machines, as compared with the native process. But in the hot weather, in the plains, when the temperature stands above 75°F., the cream must be churned three or four times over, and after the first churning the butter is grainless and greasy in texture.

Mr. E. W. Collin having pointed out in his Report on the Arts and Industries of Bengal, the importance of the dairy industry in the Kosi jungles in Purneah and in pergunnah Juanshahi in Mymensingh, and having suggested that an attempt might be made to teach the use of European dairy machines to the *gowalas* of these localities, the Government of Bengal asked my opinion as to the desirability of starting a model dairy in Purneah. I deputed Mr. Bhupal Chandra Basu to make enquiries on the subject in the Kosi jungles in Purneah, and to exhibit the working of the European dairy machines. Mr. Bhupal Chandra Basu exhibited the machines before a large gathering of *gowalas* and others interested at Damdah, a village in pergunnah Dharampur, which pergunnah includes the greater portion of the Kosi jungles. The trial gave fairly good results, and those who saw the machines at work were astonished not only at the superior quality of butter and ghee, but also at the rapidity and ease with which a large quantity of milk was converted, in the course of a few hours, into butter and ghee. The total quantity of milk dealt with at this trial was 69 seers, which gave exactly nine seers of butter, and this again, when melted, gave five seers ten chittacks of ghee. The proportion of butter to milk was 1 : 7⅔, and that of ghee to milk 1 : 12¼. The result appearing to be promising, the late Mr. E. G. Williams, Manager of the Durbhunga Raj, desired to continue the trials on a large scale, with the ultimate object of establishing a dairy factory in pergunnah Dharampur, the property of the Maharaja of Durbhunga. A set of dairy machines was lent to Mr. Williams, and a subordinate of this Department, who had been trained in the manipulation of the European dairy machines, was deputed to conduct the trials. The total quantity of milk dealt with was 12 maunds 10 seers 8 chittacks (all buffalo milk), which yielded 1 maund 15 seers 6 chittacks of butter, and the latter being melted gave 35 seers 1½ chittacks of ghee. The skim-milk was converted into *dahi* or curdled milk. The average proportion of butter to milk was 1 : 8·8, and that of ghee to milk was 1 : 13·9. The latter proportion varied, however, from day to day from 1 seer of ghee to 17·6 seers of milk up to such a high rate as one seer of ghee to 11 seers of milk, depending upon the variations in the purity of milk bought from the *gowalas*. The financial results of the trials were very satisfactory. The total expenditure, including the cost of milk, supervision, labour, fuel, and earthen utensils was Rs. 31-7-6, the proceeds from the sale of *ghee* and *dahi* being Rs. 37-15, leaving a net profit of Rs. 6-7-6. With permanent arrangements the margin of profit, it is believed, could be raised to over Rs. 10. Mr. Williams had intended to resume the trials at the end of the present rainy season, and later on to start a dairy factory in pergunnah Dharampur. It remains to be seen whether his successor will take up the scheme. Dairying may be said to be the chief industry in pergunnah Dharampur, and seems to be capable of great improvement.

Specifications of inventions.

111. About 25 applications for patents were received during the year under report from the Government of India, Revenue and Agricultural Department, and opinions were expressed upon them.

Agricultural Exhibitions.

112. Agricultural exhibitions were held during the year at Kurseong and at Khulna. Mr. Nagendra Nath Banerji, an Assistant of the Department, was present on both occasions. He exhibited several implements and assisted generally in the arrangements.

CHAPTER VI.

Cattle-breeding and Veterinary Establishment.

113. The scheme for the establishment of a Veterinary College is still under the consideration of Government. No progress appears to have been made in the matter during the year. Serious outbreaks of rinderpest have been recently reported from the districts of Backergunge and the 24-Pergunnahs, but it has not been possible, for want of any trained veterinary agency, to render any assistance in the matter.

Improvement of breeds of Cattle.

114. Many applications were received during the year for breeding bulls. Two Hissar bulls were supplied to the Collector of Tipperah, who desired to form a stud at Comillah, and one Hissar bull was supplied to the Deputy Commissioner of Manbhoom for use in the Jheria Ward's Estate. Two bulls from pergunnah Bachour, in Durbhunga, were supplied to the Settlement Officer of Western Dooars for use in the Mynaguri teshil. After the close of the year, one Hissar bull was supplied to the Superintendent of the Nuddea Jail, and another to the Superintendent of the Central Jail, Bhagulpore. The two bulls which were supplied to the Collector of Tipperah were found to be too heavy for the local breed of cattle, and were therefore sold to the Superintendent of the Dacca and Comillah Jails. The calves from an English bull supplied to the Arrah Municipality in 1887 are said to show a perceptible improvement in the local breed. The calves from an up-country bull supplied to the Subdivisional Officer of Sasseram in 1887 are also reported to be better than the local country calves.

CHAPTER VII.

AGRICULTURAL AND FISCAL STATISTICS.

115. Forecasts of the wheat, jute and rice crops were prepared during the year. It has been reported by the Committee of the Chamber of Commerce, and by wheat merchants in Calcutta, that they think that these forecasts have as a rule been correct, and that they have been found useful to traders. In accordance with the orders of the Government of Bengal, statements showing the estimated outturn of the bhadoi, of the winter rice, of the rabi harvest, and of special crops, such as sugarcane, tobacco, ganja, opium, and other crops, were also prepared. During the year under report "Returns of Agricultural Statistics" called for by the Government of India were prepared for the first time, and submitted to the Board. They include statistics of crop areas, of prices of produce, of incidence of land revenue per mile and per head of the population, of varieties of tenures held direct from Government, of area of forests, and of area irrigated by State canals.

116. As reported last year, the Department continues to be indebted to the Committee of the Calcutta Chamber of Commerce for the ready aid afforded by them, and by the Committee of the Wheat and Seed Trades Association, in all matters which have been referred to them in connection with the trade and agriculture of the province. The Agri-Horticultural Society of India has also continued to give valuable assistance on questions on which they have been consulted.

TOURS.

117. I was on tour for some days in every month, and altogether for 134 days within the year from the 1st August to the 31st of July. The places visited and the length of time devoted to each tour are given in Appendix H..

Officers of the Department.

118. During the year under report I had two assistants under me, viz., Messrs. Bhupal Chandra Basu and Nagendra Nath Banerji. Mr. Basu was engaged on purely agricultural duty during the year. Mr. Banerji was in charge of the Burdwan Farm, and also engaged in preparing an agricultural analysis of the Cuttack district.

A list is attached (Appendix D) showing the names of the several Settlement and Assistant Settlement Officers employed during the year under report.

I have the honour to be,

SIR,

Your most obedient servant,

M. FINUCANE,

Director of the Department of Land Records and Agriculture, Bengal.

APPENDICES.

APPEN

Statement showing the Government estates and temporarily-

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional* or non-professional agency.	Area surveyed.		
						Up to 31st March 1890.	During the year ending 31st March 1891.	Total area surveyed.
1	2	3	4	5	6	7	8	9
Burdwan ...	Midnapore ...	Bhetia	23	6,698	Non-professional...	6,698	...	6,698
		Kamina Chak	1	724	Ditto ...	724	...	724
Presidency ...	Nuddea	Khosalpore	...	476	Ditto ...	...	476	476
Rajshahye ...	Jalpaiguri ...	Jalpaiguri Western Dooars ...	...	973,440	Professional ...	210,842	241,459	452,301
Chittagong ...	Chittagong ...	Chittagong Sudder subdivision	1,044	1,043,200	Ditto ...	64,542	308,480	373,022
		Old thana Ramoo	50	156,390	Ditto ...	156,390	...	156,390
	Tipperah ...	Pergunnah Singergaon ...	73	3,649	Non-professional...	...	3,649	3,649
		Jowar Baluakandi	8	2,762	Ditto ...	2,762	...	2,762
		Maizurdi	5	523	Ditto ...	...	...	523
		Chur Peerbuksh	1	5,176	Ditto ..	5,176	...	5,176
	Noakhally ...	,, Fakira	...	1,981	Ditto ...	...	903	903
		,, Gazi	...	9,306	Ditto ...	...	4,410	4,410
	Backerganj ...	Madhupura	18	58,073	Professional ...	46,326	...	46,326
		Koralmara						
		Bhusan Lapta Madanpura ...						
		Lamchipata						
		Chur Joynagar						
		,, Umed						
		,, Bhoirab						
		,, Price						
		,, Lal Mohan						
		,, Lamchi Karalmara ...						
		,, Boiragia						
		,, Hardinge						
		,, Krishna Prasad						
		,, Kali						
		,, Goneshpura						
		,, Fasson						
		,, Drummond						
		,, Uday Kali						
		,, Lakhi	...	2,397				
		,, Sitaram	1	625	Non-professional...	625	...	625
		,, Kalachand	1	1,120	.....	...	...	
		,, Golokepura	1	2,023				
Dacca ...		,, Shambhupura	1	2,559				
		,, Budna	1	233	.....	...	...	...
		,, Padma	1	1,937				
		Taluk Biswanath Thakurta ..	1	19	Non-professional	19	...	19
		Chur Jangla	1	420	Ditto ...	420	...	420
		,, Badura or Bhadai ...	1	426	Ditto ...	...	...	...
		,, Shachilapur Kristokali ...	1	194	Ditto ...	194	...	194
		,, Kapalberia	1	771	Ditto ...	771	...	771
		,, Chundrial	1	665	Ditto ...	665	...	665
	Dacca ,, ...	Jowar Joymangal Tuppa Panch Bhagh.	1	1,199	Ditto ...	1,199	...	1,199
Patna ...	Shahabad	Dhan Chuhan	...	1,067	Ditto ...	1,067	...	1,067
Orissa ...	... ,,	Orissa Settlement (Cuttack, Pooree and Balasore).	5,568	3,060,480	Professional ...	...	549,003	549,003
	Cuttack	Angul	...	‡ 408,468	Ditto ...	408,468	...	408,468
		Banki	144	76,800	Ditto ...	76,800	...	76,800

DIX A.

settled tracts under survey and settlement of revenue during the year 1890-91.

Total cost up to—						Rate per acre.		Increase of revenue.		Remarks.
31st March 1890.		During year ending 1st March 1891.		Total.						
Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Actually obtained.	Expected.	
10	11	12	13	14	15	16	17	18	19	20
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs. A. P.	Rs. A. P.	Rs.	Rs.	
1,925	1,504	Nil	192	1,925	1,504	0 4 7	0 3 7	1,198	...	Settlement completed.
385	334	...	...	385	334	0 8 5	0 7 4	1,339	...	Ditto ditto.
...	...	137	...	137	...	0 4 7	...	Not known.		
1,63,014	24,755	1,39,684	21,547	3,02,698	46,302	0 10 8	...	...	60,000	From Mynaguri tehsil alone, the increase of revenue expected by the Settlement Officer is Rs. 60,000, the area in column 5 includes forest and jungle.
34,128	7,031	1,21,195	36,414	1,55,323	43,445	0 7 4	...		1,20,000	
67,400	1,495	306	10,480	67,706	11,975	0 6 11	0 1 3	1,224	32,000	Settlement nearly completed.
...	...	2,554	705	2,554	705	0 10 10	0 2 11	2,406	...	Ditto ditto.
...	...	1,447	...	1,447	...	0 8 4	...	1,206	...	Settlement completed.
...	...	180	...	180	...	0 5 6	...	...	500	
478	...	...	116	478	116	0 1 6	0 0 10	184	366	Being mostly uncultivated. Cost of survey is low.
...	...	179	...	179	...	0 3 2	...	...	...	Record of rights undertaken, because of undefined nature o rights of tenure-holders' estate undergoing diluvion, no increase of revenue expected.
...	...	1,132	...	1,132	...	0 4 1	...	...	...	
Not known. Expenditure mixed up with Dakhin Shahbazpore.	...	...	4,606		4,606	...	...	964	* 5,906	Most of these estates are churs under pasture or jungle land. A cadastral survey was made of only a few of them, the others being traverse survey. * This is expected on the fair rents that have been settled. This estate has been diluviated.
Work done by District Staff. No expenditure.						...	...	375	...	Work completed.
...	...	...	...	...	...	...	...	...	...	
...	...	...	2,203	...	2,203	...	...	...	7,707	
...	1	...	...	...	1	...	...	36	...	
...	...	...	...	...	...	...	...	...	...	
26	...	...	139	26	139	...	...	181	...	
12	..	...	90	12	90	...	...	...	...	
60	190	...	...	60	190	0 0 5	0 2 0	...	...	
40	87	...	...	40	87	...	...	235	...	Ditto.
221	94	...	67	221	161	0 2 11	...	1,106	...	Settlement completed, but final report not received.
...	...	48	...	48	...	0 0 9	...	744	...	
†24,872	...	†1,43,094	...	†1,67,966	...	...	...	...	7,00,000	† These are the figures shown by the Deputy Superintendent of Survey, and represent expenditure to end of June 1891. The figure of increase of revenue expected is purely conjectural.
1,02,357	40,363	1,261	12,667	1,03,618	53,030	0 4 0	0 2 1	63,394§	...	‡ Represents the area cadastrally surveyed. The figure given last year has been altered by the Settlement Officer, who says the area given last year was not correct.
24,674	8,018	423	4,580	25,097	12,598	0 5 2	0 2 8	7,474	...	§ This is progressive.

APPEN

Statement showing the Wards' Estates under survey

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed.		
						Up to 31st March 1890.	During the year ending 31st March 1891.	Total area surveyed.
1	2	3	4	5	6	7	8	9
Burdwan ...	Burdwan							
	Bankura							
	Birbhum							
	Midnapur							
	Hughli	Srinagar Baneli	650	4,44,800	Professional ...	444,800	...	444,800
Bhagalpore ...	Bhagalpore							
	Monghyr							
	Purneah							
	Maldah							
Burdwan ...	Burdwan		Hukumapur 88					
	Bankura							
	Birbhum	Burdwan Raj		15,586	Ditto ...	15,586	...	15,586
	Midnapur	Khas Mehals	Sujamutha 72	28,889	Ditto ...	12,160	16,729	28,889
	Hughli							
Presidency ...	Nuddea							
Rajshahye ...	Dinagepore	Sunkerpore	868	157,802	Ditto ...	157,802	...	157,802
		Churaman	191	55,134	Non-professional	55,134	...	55,134
		Maldwar	295	98,405	Professional ...	98,405	...	98,405
Dacca ...	Backerganj	Dakhin Shabazpur	51	83,616	Ditto ...	35,138	44,460	79,718
	Dacca	Talipabad						Work not
Chittagong ...	Tipperah	Serail Pargana	299	180,664	Professional ...	Not known.		180,664
		Kujong	462	236,480	Ditto ...	144,960	...	144,960
Orissa ...	Cuttack	Kanika	632	282,240	Ditto ...	115,840	166,400	282,240

Statement showing the private Estates under Survey

Burdwan ...	Midnapore ...	Kesiari	41	5,120	Non-professional..	5,120	...	5,120
		Bogri (Bachua, etc.)	4	593	Ditto ...	593	...	593
		Bogri (Kharikasali, etc.) ...	4	219	Ditto ...	219	...	219
		Gur Purusuthampur	1	492	Ditto ...	492	...	492
		Purbapitpur	2	679	Ditto ...	679	...	679
		Kodalia	1	218	Ditto ...	218	...	276
		Kripanundpur	1	276	Ditto ...	276	...	276
		Gur Moyna	1	407	Ditto ...	407	...	407
		Dakhin Moyna	1	468	Ditto ...	209	259	468
		Sudampur	1	145	Ditto ...	...	145	145
		Mouza Gur Safat	1	273	Ditto ...	...	273	273
		Mehal Chowrachak No. 363 ...	1	550	Ditto ...	...	65	65
		Nemuck Mehal	8	3,924	Ditto ...	...	2,553	2,553
		Mehal Benagalsia						Work not
		Belabaria	6	821	Ditto ...	...	821	821
		Srikanta Kalaganda						Work not
		Maguri						Ditto
	Birbhum	Mollarpore	88	26,680	Ditto ...	10,550	16,130	26,680
Rajshahi ...	Rajshahi	Dubalbati	211	41,992	Ditto ...	41,992	...	41,992
Chittagong ...	Tipperah	Alakdia Durgapur	8	1,264	Ditto	1,264	...	1,264
Presidency ...	Nuddea	Mritikerpara	5	1,685	Ditto ...	1,524	161	1,685

DIX A—*concluded.*

and settlement of rents during the year 1890-91.

Total cost up to—						Rate per acre.		Increase of rent.		Remarks.
31st March 1890.		During year ending 31st March 1891.		Total.						
Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Actually obtained.	Expected.	
10	11	12	13	14	15	16	17	18	19	20
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs. A. P.	Rs. A. P.	Rs.	Rs.	
1,32,625	1,00,840	...	47,165	1,32,625	1,48,005	0 4 9	0 5 5	25,140	...	
Nil	5,348	Nil	8,133	...	13,481	...	0 14 0	1,895	...	
...	...	...	10,252	...	10,252	...	0 5 8	...	...	Existing rents will be adhered to under terms of a compromise made by the Manager.
89,611	36,291	...	7,505	89,611	43,796	0 7 3	0 2 11	17,046	...	
20,206	13,397	...	220	20,206	13,617	0 5 11	0 3 10	141*	...	* Existing rents only were recorded.
35,900	19,350	213	5,288	36,113	24,638	0 5 8	0 2 9	4,508	...	
44,928	434	2,173	3,987	47,101	4,421	...	...	16	Not known.	
commenced.										
30,969	420	90,329	8,356	1,21,298	8,776	0 8 0	...	1,626	25,000	
47,607	6,007	3,028	9,769	50,635	15,776	0 5 8	0 5 7	814	Not known.	
32,652	831	33,165	6,140	65,817	6,971	...	...	3,731	15,000†	† This is increase reported, obtained, and expected by the Settlement Officer, but the Board think the increase too large.

and Settlement of rent during the year 1890-91.

Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs. A. P.	Rs. A. P.			
3,146	2,061	...	4,030	3,146	6,091	0 9 7	1 3 0	578	...	
462	536	...	...	462	536	0 12 6	0 14 6	388	...	
162	79	...	158	162	237	0 11 10	1 1 4	117	...	
563	...	...	...	563	...	1 0 9	1 0 9	...	...	
222	475	...	419	222	894	...	...	598	...	
136	75	...	44	136	119	...	...	204	...	
168	64	...	14	168	78	...	...	...	...	
17	...	...	236	17	236	...	0 9 11	76	...	
12	...	...	225	12	225	...	0 11 1	11½	...	
...	...	Æ	104	...	104	...	0 11 6	9	...	
...	...	...	148	...	148	...	...	12½	...	
...	...	...	...	...	...	...	...	...	...	
...	...	104	69	104	69	...	...	...	...	
commenced.										
...	...	...	40	...	40	...	...	...	...	
commenced. ditto.										
2,469	...	4,656	2,191	7,125	2,191	0 4 7	0 1 3	...	...	
9,316	17,214	...	17,381	9,316	34,595	0 3 6	0 9 4	18,177	...	
857	...	...	...	857	...	0 2 11	...	...	700	
861	...	...	854	1,340	854	1 4 9	...	...	21	

APPEN

Statement showing Progress made in Government Estates and temporarily-settled

Division.	District.	Name of estate.	Number of villages.	Total area of the estate cadastrally surveyed (in acres).	Area of which survey records were made over to Settlement Officer.	Number of raiyats.	Total number of raiyats whose rents had been recorded and status determined.	Number of cultivating tenure-holders and under-tenure-holders.	Area cultivated by them.	Number of raiyats at fixed rents.	Area held by them.
Burdwan ...	Midnapore ...	Bhetia	23	6,698	6,698	796	796	...	...	20	162
		Kamina Chak	1	724	724	251	251	...	...	...	...
Presidency ...	Nuddea ...	Khosalpur	...	476						No settlement work	
Rajshahye ...	Jalpaiguri ...	Jalpaiguri Western Dooars ...	...	973,440	...	...	...	...	...	...	...
Dacca ...	Backergunge ...	Madhupura	1	2,218	...	...	...	...	...	...	...
		Koralmara	1	1,730	...	(74) 67+7	74	67	1,067	...	...
		Bhusan Lapta Madanpura ...	1	80	...	18	18	...	...	...	...
		Lamchipata	1	1,299	...	(614) 193+419	612	193	297	...	...
		Chur Joynagar	1	8,396	...	3,778	4,254	476	1,574	...	...
		,, Umid	1	3,498	...	180	180	...	...	...	...
		,, Bhoirab	1	5,938	...	35	35	...	...	...	...
		,, Price								...	
		,, Lal Mohan	1	10,939	...	...	...	...	...	...	...
		,, Lamchi Koralmara ...	1	630	...	68	68	...	...	...	...
		,, Boiragia	1	4,637	...	...	...	...	...	...	...
		,, Hardinge	1	5,955	...	...	...	...	...	...	...
		,, Krishna Prasad	1	1,705	...	65	65	...	...	...	...
		,, Kali	1	831	...	...	...	...	...	...	...
		,, Goneshpura	1	2,854	...	...	...	...	...	...	...
		,, Fasson	1	1,503	...	...	...	...	...	...	...
		,, Drummond	1	3,170	...	...	...	...	...	...	...
		,, Uday Kali	1	285	...	...	...	...	...	...	...
		,, Sitaram	1	625	...	40	...	...	...	...	...
		,, Lakhi	1	2,397	...	(139) 42+97	139	42	1,723	...	...
		,, Kalachand	1	1,120	...	80	...	...	...	...	...
		,, Golokepura	1	2,023	...	346	346	105	3,096	...	...
		,, Shambhupura	1	2,559	...	505	505	96	3,493	...	...
		,, Budna	1	233	...	38	38	2	233	...	...
		,, Padma	1	1,938	...	533	533	8	2,698	...	...
		Taluk Biswanath Takurta ...	1	19	...	5	5	...	...	...	...
		Chur Jangla	2	420	...	291	...	1	229	...	...
		,, Badura or Bhadai ...	1	426	...	35	35	...	...	...	...
		,, Shachilapur Kristokali	1	194	...	...	...	...	...	...	...
		,, Kapalberia	1	771	...	...	...	...	...	...	...
		,, Chundrial	1	665	...	95	...	...	...	...	...
	Dacca ...	Jowar Joymangal, tuppa Manikbhagh.	10	1,199	...	394	394	...	...	...	...
Chittagong ...	Chittagong ...	Chittagong settlement ...	1,044	10,43,200	43,666	14,962	7,868	3,277	3,007	1,192	1,168
		Old thana Ramoo ...	5,787	1,56,390	1,56,390	39,825	41,965	5,743	33,626	1,694	3,760
	Tipperah ...	Pergunna Singergaon ...	73	3,649	...	797	906	18	151	...	...
		Jowar Baluakandi ...	8	2,762	2,762	1,094	1,094	...	...	...	...
		Maizurdi	5	523	523	83	139	12	50	...	...
	Noakhally ...	Chur Peerban	1	5,176	5,176	116	122	...	...	...	...
		,, Fakira	1	1,981						No settlement	
		,, Gazi	1	9,306							
Patna ...	Shahabad ..	Dhan Chahan									
Orissa ...		Orissa settlement		30,60,480							
	Cuttack ...	Angul	628	4,08,468	4,08,468	30,394	30,394	63	765	...	...
		Banki	144	76,800	76,800	23,969	23,969	4,364	8,969	...	...

DIX B.

tracts in record of rights and settlement of rents to end of the year 1890-91.

Classification of Tenants.								Total rental of tenants whose rents have been settled.				Remarks.
Number of settled raiyats.	Area held by them.	Number of occupancy raiyats, but not settled raiyats.	Area held by them.	Number of non-occupancy raiyats.	Area held by them.	Number of under-raiyats.	Area held by them.	According to settlement.	According to previous jamabandi.	Increase.	Decrease.	
								Rs.	Rs.	Rs. A. P.	Rs.	
427	2,216	348	1,873	1	1	478	1,216	2,869	1,671	1,198 0 0	...	
251	666	...	...	...	...	...	...	3,659	2,320	1,339 0 0	...	
done during the year under report.												
...	...	...	...	...	...	...	...	...	...	.....	...	
...	...	...	...	...	...	...	...	...	...	.....	...	Records received after expiry of year. No settlement work was done.
...	...	1	108	5	454	1	20	...	...	.....	...	
...	...	3	77	...	...	15	40	...	...	.....	...	The increase of rent is more than increase of revenue, as some of the rent is anticipated by tenure-holders.
...	...	388	968	13	34	18	20	9,972	9,297	675 0 0	...	
...	...	3,356	3,930	207	377	215	545	49,904	43,982	5,922 0 0	...	
...	...	52	1,300	128	2,002	...	...	...	...	.....	...	Records received by Settlement Officer after expiry of the year.
...	...	...	...	35	116	...	...	...	...	.....	...	Increase in rent due to increased rate of assessment.
...	...	...	...	...	...	...	...	...	...	.....	...	
...	...	...	...	42	591	26	142	1,598	634	964 0 0	...	Records received by Settlement Officer after expiry of the year.
...	...	...	...	...	...	...	...	...	...	.....	...	
...	...	...	...	...	...	...	...	...	...	.....	...	Ditto ditto.
...	...	37	843	...	...	28	55	1,926	456	1,470 0 0	...	Increase in rent due to increased rat of assessment.
...	...	...	...	...	...	...	...	...	...	.....	...	
...	...	...	...	...	...	...	...	...	...	.....	...	
...	...	...	...	...	...	...	...	...	...	.....	...	
...	...	...	...	...	...	...	...	...	...	.....	...	
...	...	26	531	12	93	12	10	768	393	375 0 0	...	Increase is due to accretion and to increased rate of assessment. Work completed.
...	...	28	140	55	534	14	73	...	...	.....	...	
...	...	80	1,085	...	...	...	...	...	...	.....	...	
175	919	21	202	18	81	27	163	...	...	.....	...	
290	1,065	28	195	69	210	12	35	...	...	.....	...	
16	95	...	...	5	20	15	105	...	...	.....	...	
338	1,377	53	80	121	222	16	32	...	...	.....	...	
3	19	...	...	...	...	2	13	...	25	36 0 0	...	
...	...	35	193	...	...	255	229	...	761	.....	...	
...	...	35	...	...	...	18	...	787	606	181 0 0	...	
...	...	...	...	...	...	...	...	552	529	23 0 0	...	
...	...	...	...	...	...	...	...	2,598	...	.....	...	
...	...	95	...	1	...	...	...	2,084	1,849	235 0 0	...	
...	...	...	...	...	...	...	...	1,618	512	.....	...	Increase due to increase of cultivation.
2,594	2,027	249	187	231	175	322	151	Not known.				
21,112	67,962	649	2,073	1,110	2,093	11,657	11,237	84,004	39,400	1,224 0 0	...	
779	3,497	...	...	...	...	109	290	7,197	4,791	2,406 0 0	...	
1,089	2,757	5	4	...	...	...	...	3,407	2,201	1,206 0 0	...	
30	193	53	154	...	...	44	125	...	...	.....	...	
47	1,071	13	266	56	776	6	139	2,778	2,594	184+ 366 (a)	...	
Work was done during the year under report.												(a) This increase was obtained after the close of the year.
27,706	1,42,148	224	932	...	...	2,401	3,093	1,00,551	37,157	63,394 0 0	...	
16,647	30,355	...	...	2,958	252	...	...	32,932	24,747	7,447 0 0	...	(2) The increase of rent is Rs. 8,185, but of revenue after deducting commission is Rs. 7,474. According to local custom all ryots are allowed to have occupancy rights. Chandina tenants who hold merely homestead lands and do not cultivate any land are shown as being occupancy tenants. Lakherajdars and holders at Government rents are shown as tenure-holders.

APPEN

Statement showing progress made in Ward's Estates in record of rights and

Division.	District.	Names of estates.	Number of villages.	Total area of the estate cadastrally surveyed (in acres).	Area of which survey records were made over to Settlement Officer.	Number of raiyats.	Total number of raiyats whose rents had been recorded and status determined.	Number of cultivating tenure-holders and under tenure-holders.	Are cultivated by them.	Number of raiyats at fixed rates.	Area held by them.
Burdwan ...	Burdwan ... Bankura ... Birbhum ... Midnapore ... Hughli ...	Srinagar Baneli	650	4,44,800	4,44,800	79,560	77,969	192	...	186	...
Bhagulpore ...	Bhagulpore ... Monghyr ... Purneah ... Maldah ...										
Burdwan ...	Burdwan ... Bankura Birbhum ... Midnapore ... Hughli ...	Burdwan Raj Khas Mehals	Hukunapore. 88 Sujamutha.	15,586	15,586	2,954	2,007	...	...	15	450
Presidency ...	Nuddea ...		72	28,889	16,729	12,145	3,914	...	...	2	61
Rajshahye ...	Dinagepore ...	Sunkerpore	868	1,57,802	1,57,802	32,607	32,607	3,272	...	9	...
Do. ...	Ditto ...	Churamon	191	55,134	55,134	10,481	10,481	116	2,573	12	152
Do. ...	Ditto ...	Maldwar	295	98,405	98,405	16,276	19,276	298	...	611	...
Dacca ...	Backerganj ...	Dakhin Shabazpore	37	83,616	4,877	1,248	1,032	...	...	...	...
Do. ...	Dacca ...	Talipahad	Work not commenced.								
Chittagong ...	Tipperah ...	Serail Pergunnah	299	1,80,664	79,893	60,000	1,410	38	289	...	...
Orissa ...	Cuttack ...	Kujong	462	2,36,480	1,44,000	36,085	14,512	...	...	...	...
Do. ...	Do. ...	Kanika	632	2,82,240	1,66,400	Not known	6,738	665	1,590	623	1,225

Statement showing progress made in Private Estates in record

Burdwan ...	Midnapur ...	Kesiari	41	5,120	5,120	2,454	2,454	...	...	...	...
		Bogri (Bachua, etc.) ...	4	593	593	534	534	...	...	164	...
		Bogri (Kripanundpur, etc.) ...	4	219	219	193	193	...	...	...	...
		Gur Purusuttampur	1	492	492	153	153	...	..	...	...
		Purbapitpur	2	679	679	222	222	...	...	9	...
		Kodalia	1	218	218	72	72	...	...	2	...
		Kripanandpur	1	276	276	64	64	...	...	...	...
		Gur Moyna	1	407	407	158	158	...	...	...	...
		Dakhin Moyna	1	468	468	182	182	...	...	...	...
		,, Sudampur	1	145	145	54	54	...	...	...	...
		Mouza Gar Safat ..	1	274	274	171	171	...	...	...	...
		,, Chowra Chuck No. 363	...	...	...	...	...	...	...	...	...
		Nemuck Mehal	...	...	...	...	...	...	...	...	...
		Mehal Benagalsia	...	...	...	...	...	...	...	...	...
		Balabaria	...	...	...	...	...	...	...	...	...
		Srikanta Kalaganda	...	...	...	...	...	...	...	...	...
		Maguri	...	...	...	...	...	...	...	...	...
	Birbhum ...	Mollarpur	88	26,680	19,498	4,322	3,006	22	2,745	36	128
Rajshahi ...	Rajshahi ...	Dubalhati	211	41,992	41,794	10,298	10,298	8	341	...	...
Chittagong ...	Tipperah ...	Alakdia Durgapur	8	1,264	1,264	368	368	...	...	...	...
Presidency ...	Nuddea ...	Mritikerpara	5	1,685	1,685	348	372	...	...	171	...

DIX B—*concluded.*

settlements of rents to end of the year 1890-91.

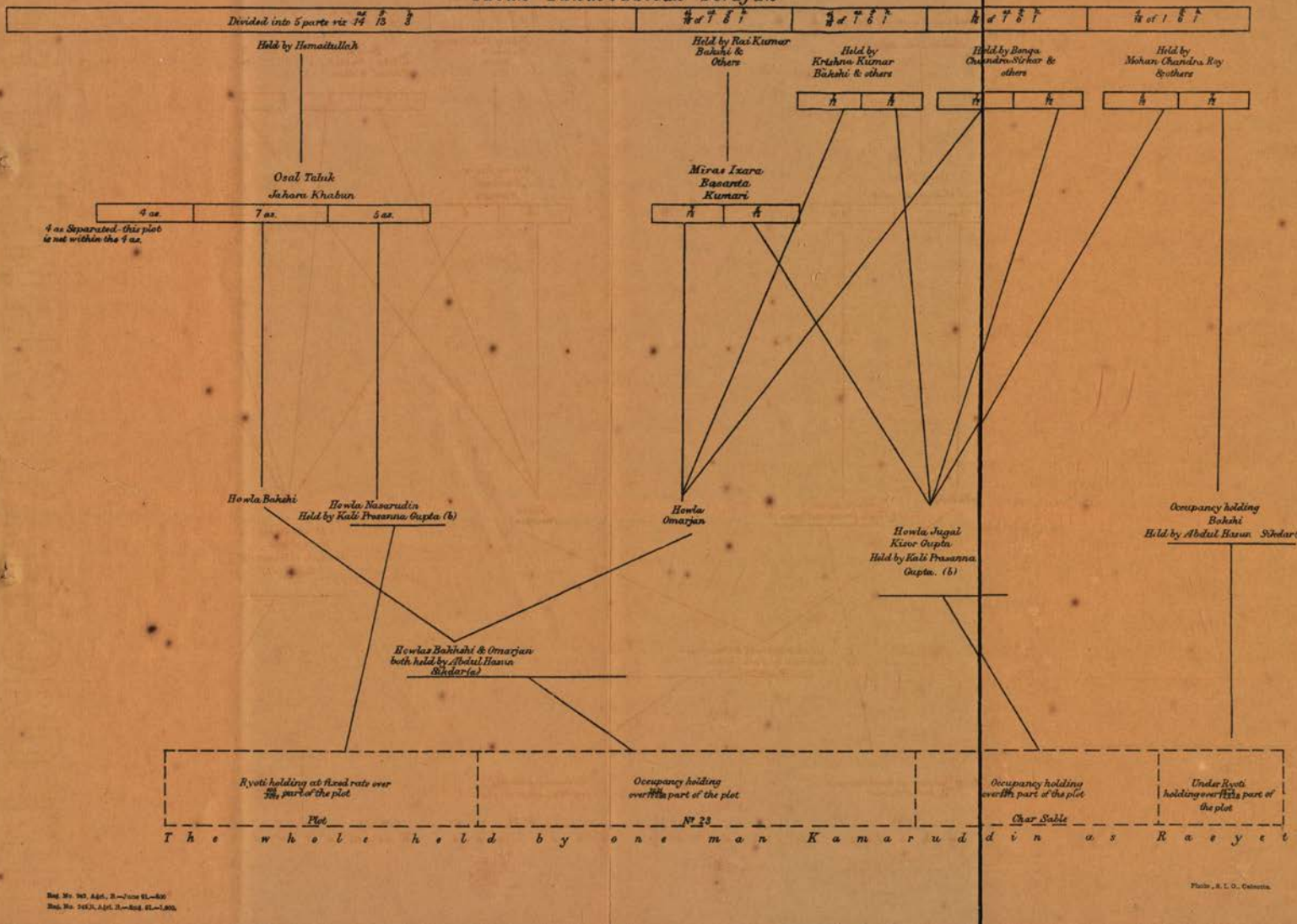
Classification of Tenants.								Total rental of tenants whose rents have been settled.				Remarks.
Number of settled raiyats.	Area held by them.	Number of occupancy raiyats but not settled raiyats.	Area held by them.	Number of non-occupancy raiyats.	Area held by them.	Number of under-raiyats.	Area held by them.	According to settlement.	According to previous jamabandi.	Increase.	Decrease.	
								Rs.	Rs.	Rs. A. P.	Rs.	
56,815	...	931	...	6,442	...	13,403	...	4,14,138	3,88,998	25,140 0 0	603	
1,177	4,627	41	193	56	186	718	337	13,580	11,685	1,895 0 0	Nil	
3,912	4,704	...	...	...	...	...	...	27,577	27,577	.....	...	
14,522	...	87	...	9,718	...	4,999	...	1,07,619	90,573	17,046 0 0	Nil	The settlement of rents is being made by compromise on the basis of existing rent being adhered to.
6,029	28,194	66	276	2,514	6,652	1,744	1,723	44,919	44,778	141 0 0	...	
7,720	...	345	...	1,351	...	8,951	...	95,714	91,206	4,508 0 0	..	
669	131	74	18	38	10	83	9	529	513	16 0 0	...	
1,372	2,598	...	...	...	...	72	50	7,230	5,604	1,626 0 0	...	
...	...	12,394	33,466	2,118	4,016	...	...	64,341	63,527	814 0 0	...	
5,450	23,558	...	...	...	...	...	...	27,709	23,978	3,731 0 0	...	

of rights and settlement of rents to end of the year 1890-91.

										Rs. A. P.		
2,363	2,989	...	...	...	...	91	70	6,464	5,886	578 0 0	...	
393	...	137	...	...	...	256	...	2,739	2,351	388 0 0	...	
193	...	...	...	...	...	11	...	541	424	117 0 0	...	
117	...	84	...	2	...	4	...	1,131	...	...	...	
184	...	29	...	...	...	123	...	2,366	1,768	598 0 0	...	
63	...	7	...	...	..	41	...	1,260	1,056	204 0 0	...	
61	...	3	...	...	...	3	...	1,212	1,212	...	...	
158	806	...	...	...	...	...	...	1,609	1,530	76	...	
182	333	...	...	...	...	...	...	1,804	1,793	11 8 9	...	
54	132	...	...	...	...	...	...	730	721	8 15 6	...	
171	146	...	...	...	...	...	...	946	933	12 9 3	...	
...	...	...	...	...	...	...	...	...	...	...	...	Work of recording rights not commenced during the year under report.
...	...	...	...	...	...	...	...	...	...	...	...	
...	...	...	...	...	...	...	...	...	...	...	...	
...	...	...	...	...	...	...	...	...	...	...	...	
...	...	...	...	...	...	...	...	...	...	...	...	
2,787	9,215	33	106	128	373	708	1,901	...	...	...	...	
9,732	23,935	2	4	556	612	6,279	5,167	...	...	...	...	
340	1,164	28	100	...	...	...	...	...	...	18,177 0 0	...	
139	...	11	...	27	...	24	...	3,596	3,575	...	...	

APPENDIX C.

Proprietors Estates 1763, and 1764


Taluk Tahmeaullah Sofajan
Divided into 5 parts viz 14 13 3
Held by Hamaitullah
Held by Rai Kumar Bakshi & Others
Held by Krishna Kumar Bakshi & others
Held by Bonga Chandra Sirkar & others
Held by Mohan Chandra Roy & others
Osal Taluk Jahara Khabun
4 as.
7 as.
5 as.
4 as Separated-this plot is not within the 4 as.
Miras Izara Basarta Kumari
Howla Bakshi
Howla Nasaruddin Held by Kali Prasanna Gupta (b)
Howla Omarjan
Howla Jugal Kisor Gupta Held by Kali Prasanna Gupta. (b)
Occupancy holding Bakshi Held by Abdul Hasan Sikdar(a)
Howlas Bakshi & Omarjan both held by Abdul Hasan Sikdar(a)
Ryoti holding at fixed rate over part of the plot
Occupancy holding over the part of the plot
Occupancy holding over the part of the plot
Under Ryoti holding over the part of the plot
Plot
No 23
Char Sable
The whole held by one man Kamarudin as Raeyet

Reg. No. 949, A&st., 2.—June 61.—500
Reg. No. 5453, A&st. 2.—Aug. 61.—1,000.

Photo., S. I. O., Calcutta.

APPENDIX D.

List of Settlement Officers at present employed on Settlement work in Bengal, with the Rank and Pay of each.

1	2	3	4	5	6	7	8
Serial No.	Name of Settlement Officer.	Pay.	Settlement allowance, if any.	In what district employed.	Whether employed in a private or Government estate.	Substantive and officiating appointment.	REMARKS.
		Rs.	Rs.	(*A*)—*List of Officers employed exclusively on settlement work.*			
1	Babu Sukumar Haldar	250	100	Beerbhoom	Burdwan Raj Estate (Hukumapore ward's estate).	Temporary Deputy Magistrate and Deputy Collector, 7th grade.	
2	Munshi Nundji	300	100	Ditto and Rajshahye ...	Mallarpore and Dubulhati private estate	Deputy Collector, 7th grade, and temporary in the 6th grade.	
3	Mr. D. L. Roy	250	100	Midnapore	Burdwan Raj Estate (Sujamutha ward's estate).	Temporary Deputy Magistrate and Deputy Collector, 7th grade.	
4	Mr. D. Sunder	300	100	Julpaigori	Western Dooars (Government estates) ...	Deputy Collector, 6th grade.	
5	Babu Harish Chunder Rai	200	Nil	Ditto	Ditto ditto ...	Nil.	
6	,, Rash Mohun Chunder	100	Nil	Ditto	Ditto ditto ...	Nil.	
7	Mr. D. D. Dutta	250	.....	Backergunge	Government estates	Substantive in the Educational Service.	
8	Babu Peary Mohun Bose	175	100	Ditto	Dakhin Shahbazpore ward's estate... ...	Sub-Deputy Collector, 3rd grade, temporary in the 2nd grade.	
9	,, Kali Sunker Sen	400	100	Tipperah	Serail ward's estate	Deputy Collector, 5th grade.	
10	Mr. F. A. Slack, C.S.	900	200	Chittagong	Government estates	Joint-Magistrate and Deputy Collector, 1st grade.	
11	,, C. G. H. Allen, C.S.	500 + 266-10-8 acting allowance = 766-10-8.	200*	Ditto	Ditto	Assistant Magistrate and Collector, Chittagong.	* Recommended for this allowance.
12	,, A. K. Raye	250	100	Ditto	Ditto	Temporary Deputy Magistrate and Deputy Collector, 7th grade.	Joined, but not gazetted yet; now posted to Tipperah as Deputy Collector.
13	Babu Gurga Churn Ghose	200	100	Ditto	Ditto	Temporary Sub-Deputy Collector, 1st grade	Recommended, but not appointed yet in the Chittagong settlement.
14	,, Jogendro Kumar Bose	150	100	Ditto	Ditto	Sub-Deputy Collector, 4th grade, temporary in the 3rd grade.	
15	,, Ramesh Chunder Dass	100	100	Ditto	Ditto	Offg. 4th grade Sub-Deputy Collector.	
16	Mr. E. W. Collin, C.S.†	700 + 533-5-4 acting allowance = 1,233-5-4.	200	Purneah	Srinagur-Baneili, ward's estate	Joint-Magistrate and Deputy Collector, 2nd grade, and Magistrate and Collector, 3rd grade.	† Recently returned to the general line.
17	Babu Burhandeo Narain	300	100	Ditto	Ditto ditto	Deputy Magistrate and Deputy Collector, 6th grade.	
18	Mr. J. A. Craven	500	100	Nya Doomka	Sonthal Pergunnahs private estate ...	Deputy Magistrate and Deputy Collector, 4th grade.	
19	Babu Rash Behary Dutt	150	Not known ...	Ditto	Ditto ditto	Temporary Sub-Deputy Collector in the 3rd grade.	Not under Director's supervision.
20	,, Jogendro Chunder Bhunjo ...	100	Ditto ...	Ditto	Ditto ditto	Temporary Sub-Deputy Collector in the 4th grade.	
21	,, Bolaram Das Gupto	100	Ditto ...	Ditto	Ditto ditto	Canoongoe (Settlement Office)	
22	Mr. H. R. Reily	1,400	Nil	Orissa districts	Government estates	Deputy Magistrate and Deputy Collector, 4th grade.	Consolidated pay Rs. 1,400 specially sanctioned.
23	,, E. H. C. Walsh, C.S.	500 + 266-10-8 acting allowance = 766-10-8.	‡	Cuttack	Ditto	Assistant Magistrate and Collector and Offg. Joint-Magistrate and Deputy Collector, 1st grade.	‡ Not yet settled.
24	,, D. N. Mookerjee	200	100	Pooree	Ditto	Probationary Deputy Magistrate and Deputy Collector.	
25	Babu Chuku Lall Sarcar	100	100	Cuttack	Ditto	Sub-Deputy Collector, 4th grade.	

1	2	3	4	5	6	7	8
Serial No.	Name of Settlement Officer.	Pay.	Settlement allowance, if any.	In what district employed.	Whether employed in a private or Government estate.	Substantive and officiating appointment.	Remarks.
		Rs.	(A)—*List of Officers employed exclusively on settlement work*—concluded.				
26	Mr. J. Taylor	200 + 100 local allowance = 300.	*	Cuttack	Government estates	Tehsildar.	
27	Mr. A. C. Sen	320 + 174-10-8 acting allowance = 490-10-8.	*	Ditto	Ditto	Assistant Magistrate and Collector, Officiating Joint Magistrate and Deputy Collector, 1st grade.	* Question of settlement allowance not yet decided.
28	,, S. K. Agasti	400-10-8 including acting allowance.	*	Ditto	Orissa Government estates	Assistant Magistrate and Collector. Offg. Joint-Magistrate and Deputy Collector, 1st grade.	
29	,, B. C. Mitra	Ditto ...				Ditto ditto ditto.	
30	,, Tahiruddin Ahmad	200				Assistant Magistrate and Collector, Pubna.	
31	Babu Chunder Nath Ghose	250	Nil	Ditto	Kujong ward's estate	Sheristadar, Burdwan Judge's Court.	
32	Mr. S. N. Dutta	250	Nil	Ditto	Kanika Ditto	None.	
33	Babu Sosi Bhusan Dutta	150	Nil	Tipperah	Government estate	None.	
		Rs.	(B)—*List of Officers employed on settlement work in addition to other duties, forming part of the regular district staff.*				
34	Babu Rajendro Rai	500	Nil	Midnapore	Government and private estates of Midnapore.	Deputy Collector 4th grade.	
35	,, Chunder Shekur Ker	300	Nil	Ditto	Kamina Chak Government estate	Deputy Collector, 6th grade.	
36	Mr. R. Nathan, C.S., Sub-divisional Officer.	500 + 200 acting allowance = 700	Nil	Meherpore sub-division, district Nuddea.	Hanspookaria Government estate	Assistant Collector, Offg. Joint-Magistrate and Deputy Collector, 1st grade.	
37	Babu Rajani Nath Chatterjee, Sub-divisional Officer of Kushtea.	500	Nil	Nuddea	Goalgram Government estate	Deputy Collector, 4th grade.	
38	Babu Bhagobati Churn Bhattacharjea	150	Nil	Ditto	Mritikapara private estate	Sub-Deputy Collector, 3rd grade.	
39	,, Hem Chunder Mitter	175	Nil	Ditto	Khosalpore Government estate	Ditto, ditto, and Offg. in the 2nd grade.	
40	,, Sita Nath Mukerjee	175	Nil	Pubna	Government and private estates ...	Sub-Deputy Collector, 2nd grade	Employed on settlement work under the old regulations.
41	,, Chunder Coomar Dutta	500	Nil	Dacca	Joar Joy Mangal Tuppeh Panch Bhagh Government estate..	Deputy Collector, 4th grade.	
42	,, Rajani Coomar Dutta	500	Nil	Tipperah	Singergaon Government and other Government and private estates.	Deputy Collector, 5th grade, temporary in the 4th grade.	
43	,, Jamini Mohun Dass	250	Nil	Noakhally	Government and other estates	Temporary Deputy Collector, 7th grade.	
44	Moulvi Shere Ali	400	Nil	Shahabad	Government estates	Deputy Collector, 5th grade.	
45	Moulvi Syed Nurul Hudu, Sub-divisional Officer, Barh.	320 + 170-10-8 acting allowance = 490-10-8.	Nil	Patna	Pyaripore private estate	Assistant Magistrate and Collector, Barh; Offg. Joint-Magistrate and Deputy Collector, 1st grade.	
46	Babu Nowrungi Lall	250	Nil	Chumparun	Ruksole in the Hurdi factory, private estate	Temporary Deputy Collector, 7th grade ...	Recommended for this estate.
47	,, Narain Chunder Naik	200 + 100 local allowance = 300.	100	Cuttack	Angul Government estates	Tehsildar.	

APPENDIX E.

Statement showing the Results of Experiments in Potatoes in the Bhojpore Farm, Dumraon, 1890-91.

Plot.	Manures.	Quantity of manures per acre.	Outturn per acre.	Value of outturn.	Total cost of cultivation.	Net profit.	Net loss.
		Mds. s.	Mds. s.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
5	No manure	.....	100 17	87 14 0	85 13 4	2 0 8	.....
6	Bonemeal	12 0	108 36	95 4 7	104 5 9	.....	9 1 2
8	Green manured with Sewan grass and bonemeal.	6 0	137 1	119 14 4	100 8 3	19 6 1	.....
9	Green manured with hemp	.....	140 26	123 11 0	91 14 0	31 3 1	.....
10	Ditto ditto and bonemeal	6 0	150 1	131 4 4	101 5 5	29 14 11	.....
11	Linseed-cake	12 0	118 23	103 12 0	104 11 10	.....	0 15 10
12	Ashes	84 28	118 23	103 12 0	89 9 10	14 2 2	.....
13	Cowdung	300 0	111 0	97 2 0	99 13 2	.....	2 11 2
14	No manure	.....	101 1	88 6 4	85 13 4	2 9 0	.....

Statement showing the Results of Experiments in Wheat in the Dumraon Farm, 1890-91.

Plot.	Manures.	Quantity of manures.	Outturn per acre.		Value of the outturn per acre.		Total value of the outturn.	Total cost of cultivation.	Net profit + or loss —.
			Grain.	Straw.	Of grain.	Of straw.			
		Mds. s.	Mds. s.	Mds. s.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
35	Green manuring with hemp	.....	9 3	12 28	24 3 2	4 3 8	28 6 10	27 0 7	+1 6 3
36*a*	Cowdung	180 0	9 27	13 24	25 12 9	4 8 6	30 5 3	41 5 5	−11 0 2
	Crude saltpetre	3 0							
36*b*	Crude saltpetre	3 0	12 4	14 14	32 4 3	4 12 6	37 0 9	32 10 3	+4 6 6
37*a*	Bonemeal	8 0	8 18	9 3	22 8 6	3 0 5	25 8 11	33 3 11	−7 11 0
37*b*	No manure	.....	7 16	7 34	19 11 8	2 9 10	22 5 6	21 0 9	+1 4 9
38*a*	Cowdung	180 0	10 5	15 5	27 0 0	5 0 7	32 0 7	29 12 0	+2 4 7
38*b*	No manure	.....	7 10	9 33	19 5 4	3 4 4	22 9 8	21 0 9	+1 8 11
39*a*	Ashes	84 28	8 12	9 3	22 2 1	3 0 5	25 2 6	22 12 0	+2 6 6
39*b*	Ashes	84 28	12 10	13 6	32 10 8	4 6 1	37 0 9	34 9 7	+2 7 2
	Crude saltpetre	3 0							

Statement showing the Results of Experiments in Winter Paddy in the Dumraon Farm, 1890-91.

Plot.	Manures.	Quantity of manures per acre.	Outturn per acre.		Value of produce.	Total cost of cultivation.	Net profit + or loss —.
			Grain.	Straw.			
	(*a*) *Transplanted paddy.*	Mds. s.	Mds. s.	Mds. s.	Rs. A. P.	Rs. A. P.	Rs. A. P.
13	Crude saltpetre	3 1	27 15	39 13	52 14 11	35 14 8	+17 0 3
	Linseed-cake	3 1					
14	Ashes	181 20	24 32	37 20	48 9 2	26 3 5	+22 5 9
15	Crude saltpetre	3 1	18 6	26 0	35 1 0	31 6 1	+3 10 11
16	Linseed-cake	3 1	17 9	15 5	30 1 6	24 9 2	+5 8 4
17	No manure	.....	15 5	24 8	30 1 0	19 12 7	+10 4 5
	(*b*) *Broadcasted paddy.*						
3	Lime	9 3	17 15	25 28	33 13 4	17 5 9	+16 7 7
4	No manure	.....	16 25	20 22	31 0 5	13 14 4	+17 2 1
5	Cattledung	181 20	30 10	49 6	60 6 1	21 1 3	+39 4 10
6	Linseed-cake	3 1	17 38	27 15	35 3 9	18 10 11	+16 8 10
7	Cattledung	181 20	24 26	51 17	52 15 11	24 8 8	+28 7 3
	Lime	9 3					
8	Crude saltpetre	3 1	17 38	24 20	34 4 5	28 10 3	+5 10 2
	Lime	9 3					
9	Sweepings	181 20	18 18	33 11	37 15 7	19 3 0	+18 12 7
10	Crude saltpetre	3 1	15 5	24 14	30 1 10	25 7 10	+4 10 0
11	Sweepings	181 20	21 7	34 31	42 6 2	22 10 6	+19 11 8
	Lime	9 3					
12	Crude saltpetre	3	14 20	26 12	29 13 8	30 0 5	−0 2 9
	Linseed-cake	3 1					

APPENDIX F.

Statement showing the Results of Experiments in Sugarcane in the Seebpore Farm, 1890-91.

Field, row, plot.	Character of experiment (manures used).	Price of manures.	Total cost of cultivation (including price of manures).	Yield of concrete (gur).	Price of gur.	Price of bye-products.	Value of total outturn.	Profit.	Loss.	Per cent. of gur on weight of canes.	Per cent. of gur on weight of juice.
		Rs. A. P.	Rs. A. P.	Mds. s. ch.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.		
	1. Effects of various manures (all with Samsera canes). Mds.										
F1. R3. P1	Oil-cake 12	19 4 0	93 9 0	23 21 4	100 0 0	7 6 0	107 6 0	13 13 0	.....	12·4	19·5
F1. R3. P2	Oil-cake 8 ... ... Super 2	22 12 0	84 10 6	18 27 8	79 6 6	6 6 0	85 12 6	1 2 0	.....	11·3	21·2
F1. R3. P3	No manure	.....	38 15 0	5 32 8	24 12 0	3 4 0	28 0 0	.....	10 15 0	11·8	24·6
F1. R3. P4	Super 2½ ... ... Gypsum 3 ... ... Saltpetre 30 seers ...	18 8 0	94 9 0	23 30 0	102 15 0	6 6 0	109 5 0	14 12 0	.....	14·1	20·3
F1. R3. P5	Oil-cake 8 ... ... Bonemeal 4	21 8 0	96 9 0	18 30 0	79 11 0	5 6 0	85 1 0	.....	11 8 0	11·8	20·0
	2. Variety experiments(*a*) (Saharanpur red)										
F1. R4. P2	Oilcake 6 mds. ...	9 0 0	80 10 0	26 10 0	111 9 0	7 4 0	118 13 0	38 3 0	.....	9·6	16·9

(*a*) There were eight varieties altogether in cultivation, but the area assigned to each being small, no separate accounts were kept except for Saharanpur red, which was the best among them.

APPENDIX G.

Statements showing the results of experiments in the Burdwan Farm.

(*A*) Fresh-planted sugarcane.

Plot.	Area in cottahs.	Manures applied per bigha.	Actual outturn. Weight of canes.	Actual outturn. Weight of juice.	Actual outturn. Weight of *gúr*.	Outturn per bigha. Weight of canes.	Outturn per bigha. Weight of juice.	Outturn per bigha. Weight of *gúr*.	Cost per bigha. Price of manure.	Cost per bigha. Other expenditure.	Cost per bigha. Total.	Price of outturn per bigha.	Loss or gain per bigha.
			Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
						I.—Red Saharunpur.							
30	2½	Bonemeal ... 8 0 0	15 0 0	10 6 0	2 14 1	120 0 0	81 8 0	18 32 8	16 0 0	41 12 0	57 12 0	75 4 0	+17 8 0
						II.—Samshara.							
31	2½	Unmanured	9 15 0	4 24 0	1 9 14	75 0 0	36 32 0	9 39 0	.....	37 10 0	37 10 0	39 14 0	+ 2 4 0
32	2½	Bonemeal ... 8 0 0	21 10 0	12 22 0	3 4 10	170 0 0	100 16 0	24 37 0	16 0 0	43 4 0	59 4 0	99 10 0	+40 6 0
33	2½	Castor-cake ... 16 0 0	24 15 0	15 2 0	3 9 1	195 0 0	120 16 0	25 32 8	18 0 0	43 9 0	61 9 0	103 4 0	+41 11 0
34	2½	Saltpetre ... 0 32 0 Super ... 5 0 0	20 0 0	12 0 0	3 1 4	160 0 0	96 0 0	24 10 0	16 8 0	41 2 0	57 10 0	97 0 0	+39 6 0
35	2½	Saltpetre ... 0 31 0 Super ... 2 13 8 Bonemeal ... 3 0 0	24 20 0	16 0 0	3 10 8	196 0 0	128 0 0	26 4 0	15 10 0	43 10 0	59 4 0	104 8 0	+45 4 0
36	2½	Ditto ... 5 0 0 Castor-cake ... 10 0 0	28 10 0	17 0 0	3 27 3	226 0 0	136 0 0	29 17 8	22 12 0	43 10 0	66 6 0	117 4 0	+50 14 0
37	2½	Cowdung ... 100 0 0	20 0 0	13 20 0	3 3 1	160 0 0	108 0 0	24 24 8	3 2 0	42 11 0	45 13 0	99 12 0	+53 15 0

(*B*) Ratooned sugarcane.

			Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
						Ratooning, 3rd year.							
38	2½	Cowdung ... 100 0 0	57 15 0	28 36 0	5 8 8	459 0 0	231 8 0	41 28 0	3 0 0	60 0 0	63 0 0	208 8 0	+ 145 8 0
						Ratooning, 1st year.							
14	5	Super ... 2 8 0 Saltpetre ... 0 30 0	58 15 0	30 20 0	5 13 0	233 20 0	122 0 0	21 12 12	8 2 0	33 10 0	41 12 0	106 9 6	+ 64 13 6
15	5	Mustard ... 5 0 0 Castor-cake ... 5 0 0	60 35 0	32 10 0	5 27 8	243 20 0	129 0 0	22 30 0	11 12 0	33 10 0	45 6 0	113 12 0	+ 68 6 0

(*C*) Trench and country sowing—Khari sugarcane.

		Mds.	Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
61A	10	Cowdung 100 { Trench Castor-cake 2 { sowing	110 35 0	60 2 20	10 15 12	221 30 0	120 4 0	20 31 8	10 6 0	35 2 9	45 8 9	103 13 0	+ 58 4 3
61B	10	Cowdung 100 { Line Castor-cake 2 { sowing	56 10 0	28 25 0	5 6 9	112 20 0	57 10 0	10 3 2	10 6 0	21 8 9	31 14 9	50 10 0	+ 18 11 3

Fodder grasses.

Field number.	Area in cottahs.	Manures applied per bigha.	Name of grass.	Actual outturn.	Outturn per bigha.	Cost of cultivation per bigha. Price of manure.	Cost of cultivation per bigha. Other expenditure.	Cost of cultivation per bigha. Total.	Price of outturn per bigha.	Loss or gain per bigha.
				Mds. s. ch.	Mds. s. ch.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
23A	5	Bonemeal, one maund	Sorghum ...	36 36 0	147 24 0	1 12 0	3 6 10	5 2 10	23 1 0	+ 17 14 2
23B	5	Unmanured	Ditto ...	29 6 0	116 24 0	...	3 6 10	3 6 10	18 3 6	+ 14 12 8

Aus paddy.

Field number.	Area in cottahs.	Quantity of manure applied per bigha.	Actual outturn. Paddy.	Actual outturn. Straw.	Outturn per bigha. Paddy.	Outturn per bigha. Straw.	Cost of cultivation per bigha. Price of manure.	Cost of cultivation per bigha. Other expenditure.	Cost of cultivation per bigha. Total.	Price of the outturn per bigha.	Loss or gain per bigha.
			Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Mds. s. ch.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
					Aus paddy after by gram.						
2	6	Unmanured	1 35 0	2 12 0	5 33 4	7 16 8	...	4 5 2	4 5 2	6 11 3	+ 2 6 1
3	8½	Bonemeal, 1 maund	3 20 0	5 15 0	8 9 7	12 25 14	1 12 0	4 6 2	6 2 2	8 8 8	+ 2 6 6
4	5½	Unmanured	2 10 0	3 0 0	8 7 5	10 36 5	...	4 8 10	8 8 10	8 7 8	+ 2 14 10
					Aus paddy after by wheat.						
5	10	Unmanured	3 20 0	4 10 0	7 0 0	8 20 0	...	4 6 0	4 6 0	7 5 0	+ 2 15 0
6	10	Bonemeal, 1 maund	3 10 0	4 4 0	6 20 0	8 8 0	1 12 0	4 2 6	5 14 6	7 1 8	+ 1 3 2
7	7	Saltpetre, 10 seers	3 20 0	4 22 0	10 0 0	13 20 11	1 4 0	4 8 8	5 12 8	9 11 8	+ 4 15 0
					Aus paddy after by potatoes.						
11	6½	Bonemeal, 1 maund	2 24 0	4 0 0	8 0 0	12 12 0	1 12 0	4 6 6	6 2 6	8 13 2	+ 2 10 8
					Aus paddy after by peas.						
64B	6	Cowdung, 50 maunds	1 25 0	2 26 0	5 16 8	7 26 10	2 9 8	4 1 0	6 10 8	6 1 0	− 0 9 8
65B	6½	Unmanured	1 25 0	2 12 0	4 32 9	6 32 7	...	4 1 0	4 1 0	5 9 0	+ 1 8 0
66B	6½	Castor-cake, 2 maunds	2 20 0	3 16 0	7 15 4	13 26 11	3 3 1	4 6 6	7 9 7	7 12 1	+ 0
					Aus paddy after by lentils.						
67B	6½	Bonemeal, 1 maund	2 5 0	2 36 0	6 11 13	9 13 0	1 12 0	4 3 2	5 15 2	6 10 6	+ 0 11 4
68B	7	Unmanured	1 25 0	2 26 0	4 25 11	7 22 10	...	4 1 0	4 1 0	5 14 0	+ 1 13 0
69B	7½	Castor-cake, 2 maunds	2 7 0	3 4 0	5 32 0	8 10 8	3 3 0	4 2 0	7 5 0	6 6 5	− 0 14 7
70B	7	Bonemeal, 1 maund	3 20 0	5 6 0	10 1 8	14 8 6	1 12 0	4 8 6	6 4 6	11 4 7	+ 5 0 1
71B	7½	Unmanured	2 10 0	3 0 0	6 0 0	8 0 0	...	4 1 3	4 1 3	6 8 1	+ 2 6 10
72B	8 {	Bonemeal, 1 maund	3 6 10	3 32 0	7 35 0	9 20 0	3 0 0	4 8 0	7 8 0	7 12 0	+ 0 4 0
	{	Saltpetre, 10 seers									

Potato.

Field No.	Area in cottahs.	Manures applied per bigha.	Actual outturn.	Outturn per bigha.	Cost of cultivation per bigha.			Price of outturn per bigha.	Loss or gain per bigha.
					Price of manure.	Other expenditure.	Total.		
			Mds. s. ch.	Mds. s. ch.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
		Manure experiment with Naini Tal potatoes.							
43	15	Cowdung, 200 baskets (or 100 maunds). Ashes, 50 bags (or 25 maunds). Bonemeal, 4 maunds ... Castor-cake, 2 do.	47 5 0	62 33 0	14 6 0	42 7 4	57 13 4	82 7 3	+24 9 11
44A	1½	Castor, 12 do.	3 1 0	48 16 0	21 0 0	35 12 0	56 12 0	63 8 4	+6 12 4
44B	1½	Cowdung, 200 do. ... ... Castor-cake, 6 do.	3 12 0	52 32 0	18 8 0	35 12 0	54 4 0	65 1 7	+10 13 7
45A	2½	Cowdung, 200 do. ... ... Bonemeal, 2 do.	7 15 8	59 4 0	11 8 0	35 12 0	47 4 0	77 9 1	+30 5 1
45B	2½	Cowdung, 400 do.	6 6 0	49 8 0	16 0 0	35 12 0	51 12 0	64 9 2	+12 13 2
46A	1	Bonemeal, 4 do.	1 15 11	27 33 12	7 0 0	30 11 8	37 11 8	36 8 8	—1 3 0
46B	1	Unmanured	0 36 5	18 6 0	Nil	30 11 8	30 11 8	23 13 1	—6 14 7
New field.	2½	Pit, bonemeal, 4 maunds ... Ashes, 8 do. ...	5 9 0	40 0 0	8 0 0	35 12 0	43 12 0	52 8 0	+8 12 0
		Variety experiment with Naini Tal and country potatoes.							
52A	4	Cowdung, 200 baskets (or 100 maunds). Ashes, 50 bags (or 25 maunds). Bonemeal, 4 maunds ... ... Castor-cake, 2 do.	Naini Tal 8 25 0	40 5 0	14 6 0	29 12 3	44 2 3	52 10 7	+8 8 4
52B	4	Ditto do.	Bhengajhara. 4 30 5	24 15 0	14 6 0	24 13 1	39 3 1	24 6 0	—14 13 0
52C	4	Ditto do.	Thikara. 2 25 0	13 5 0	14 6 0	24 13 1	39 3 1	13 2 0	—26 1 0
			Mds. s. c.						
		Manure experiment with country potatoes.							
11A	3½	Horsedung ... 5 15 6 Bonemeal ... 3 3 1	1 6 4	7 4 9	6 10 0	22 3 0	28 13 0	7 1 9	—21 11 3
11B	3½	Ditto ... 4 0 0	0 36 4	5 23 0	7 0 0	22 6 9	29 6 9	5 9 3	—23 13 6
55	9½	Castor-cake ... 8 0 0	8 6 0	17 35 0	13 15 6	24 3 11	38 3 5	17 14 0	—20 5 5
56A	4½	Bonemeal ... 4 0 0	1 26 8	5 12 12	7 0 0	24 3 11	31 3 11	5 5 0	—25 14 11
56B	6½	Cowdung ... 100 0 0	7 10 6	23 3 15	4 0 0	24 5 7	28 5 7	23 1 6	—5 4 1
56C	2½	Unmanured	0 14 0	2 31 0	Nil	22 0 0	22 0 0	2 14 6	—19 1 6

Ratooned cotton.

Field No.	Area in cottahs.	Name of cotton.	Quantity of manure applied per bigha.	Actual outturn.	Outturn per bigha.	Cost of cultivation per bigha.			Price of outturn per bigha.	Loss or gain per bigha.
						Price of manure.	Cost of cultivation.	Total.		
				M. s. ch.	M. s. ch.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
53	8½	Nankin cotton ...	Bonemeal, 1 maund ...	0 34 8½	2 1 4	1 12 0	5 2 3	6 14 3	10 2 6	+3 4 3
54	8½	American ,, ...	Ditto, ditto ...	0 25 8	1 20 0	1 12 0	4 13 10	6 9 10	7 8 0	+0 14 2

Wheat.

Field No.	Area in cottahs.	Quantity of manure applied per bigha.	Actual outturn.		Outturn per bigha.		Cost of cultivation per bigha.			Price of the outturn per bigha.	Loss or gain per bigha.
			Grain.	Straw.	Grain.	Straw.	Price of manure.	Cost of cultivation.	Total.		
			M. s. ch.	M. s. ch.	M. s. ch.	M. s. ch.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
5	10	Unmanured	0 26 0	1 0 0	1 12 0	2 0 0	...	4 10 0	4 10 0	4 6 6	−0 3 6
6	10	Bonemeal, 1 maund ...	1 0 0	2 0 12	2 0 0	4 1 8	1 12 0	4 10 0	6 6 0	7 4 3	+0 14 3
7	7	Saltpetre, 10 seers ...	0 19 14	1 1 12	1 26 4	2 39 4	2 15 0	4 14 9	7 13 9	6 13 6	−1 0 3
8	10	Unmanured	0 28 0	1 6 12	1 16 0	2 13 8	...	4 10 0	4 10 0	5 13 6	+1 3 6
9	10	Bonemeal, 1 maund ...	1 5 4	1 19 0	2 10 8	2 38 0	1 12 0	4 10 0	6 6 0	7 6 6	+1 0 6
10	6	Saltpetre, 10 seers ...	0 33 2	2 0 0	2 30 6	6 26 8	2 15 0	4 8 6	7 7 6	10 9 3	+3 1 9

Oat.

			M. s. ch.	M. s. ch.	M. s. ch.	M. s. ch.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
67	12½	Cowdung, 50 maunds ...	2 5 8	3 8 4	3 14 2	5 1 3	2 0 0	5 4 0	7 4 0	12 9 5	+5 5 5
68	14	Unmanured	1 28 0	2 22 0	2 17 2	3 25 11	...	5 6 5	5 6 5	9 1 9	+3 11 4
69	15	Refuse, 50 maunds ...	1 36 7	2 34 10	2 21 14	4 11 14	2 0 0	5 6 0	7 6 0	9 13 0	+2 7 0

Barley.

			M. s. ch.	M. s. ch.	M. s. ch.	M. s. ch.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
62A	5	Cowdung, 50 maunds ... Saltpetre, 10 seers ...	1 4 14	1 4 0	4 19 8	4 16 0	4 15 0	3 2 0	8 1 0	8 9 0	+0 8 0
62B	5	Unmanured	0 12 8	0 36 0	1 10 0	3 24 0	...	3 2 0	3 2 0	3 9 6	+0 7 6

Gram.

			M. s. ch.	M. s. ch.	M. s. ch.	M. s. ch.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
2	6	Unmanured	0 5 0	0 6 0	0 16 10	0 20 0	...	3 3 8	3 3 8	1 1 9	−2 1 11
3	8½	Bonemeal, 1 maund ...	1 0 0	1 10 0	2 14 2	2 37 0	1 12 0	3 6 8	5 2 8	6 5 0	+1 2 4
4	5½	Cowdung, 50 maunds ...	0 25 0	0 31 4	2 10 14	2 33 4	2 0 0	3 8 4	5 8 4	6 1 6	+0 9 2

APPENDIX H.

TOUR.

Statement showing places visited and time spent on tour.

From 13th to 26th August 1890	(14 days) ...	Accompanied Dr. Voelcker to Serajgunge, Doomraon, Serraha, Motiharee and Bettiah.
„ 27th August to 3rd September 1890	(8 days) ...	Bhagulpore and Sonthal Pergunnahs. In connection with the settlement of the Sonthal Pergunnahs.
„ 9th to 16th September 1890	(8 days) ...	Orissa. In connection with the survey and settlement of Orissa.
„ 2nd to 17th October 1890	(16 days) ...	Simla. To attend conference.
„ 12th to 24th December 1890	(13 days) ...	Chittagong. Inspection of the survey and settlement of that district.
„ 9th to 20th January 1891	(12 days) ...	Accompanied His Honour the Lieutenant-Governor to Cuttack on duty in connection with survey and settlement of Orissa.
„ 6th to 10th February 1891	(5 days) ...	Purneah, Mollarpore and Burdwan. Inspection of the survey and settlement of Srinagar-Baneli Raj, Mollarpore, and Burdwan Raj estates.
„ 13th to 22nd February 1891	(10 days) ...	Accompanied His Honour the Lieutenant-Governor to Chittagong on duty in connection with the survey and settlement of that district.
„ 12th to 16th March 1891	(5 days) ...	Sooree. Inspection of the survey and settlement of Hukumapore estate.
„ 18th to 22nd March 1891	(5 days) ...	Sujamutha. Inspection of the settlement of the Sujamutha Wards' estate.
„ 9th to 17th April 1891	(9 days) ...	Brahmanberia and Dacca. Inspection of the survey and settlement of Dacca Government and Serail Wards' estates.
„ 17th to 23rd April 1891	(7 days) ...	Backergunge and Dawlatkhan, the head-quarter of Dakhin Shahabazpore Wards' estates. Inspection of the Government and Wards' estates settlement.
„ 9th to 12th May 1891	(4 days) ...	Ghatal. Chattragunge. Inquiries connected with Mr. Keighley's system of rearing cocoons.
„ 11th to 14th June 1891	(4 days) ...	Maldah. In connection with the settlement of pergunnah Akbarabad, Srinagar-Baneli Raj estates.
„ 29th to 30th June 1891	(2 days) ...	Burdwan. In connection with the settlement of the Burdwan Raj khas mehals.
„ 7th to 18th July 1891	(12 days) ...	Cuttack and Kanika. Inspection of the settlement work of Orissa, and Kanika Wards' estates.
Total	... (134 days).	

R. D'R. & others—Reg. No. 2123J—1,000—11 8-91.

REVENUE DEPARTMENT.

LAND REVENUE—No. 1118L.R.

DARJEELING, THE 28TH SEPTEMBER 1891.

RESOLUTION.

READ—

The Annual Report of the Director of Land Records and Agriculture, Bengal, for the year 1890-91.

The Director's report is divided into two main parts, of which the first deals with the surveys and settlements in progress during the year; the second relates to agricultural enquiries and improvements and cognate subjects.

I.—SURVEYS AND SETTLEMENTS AND MAINTENANCE OF VILLAGE RECORDS.

2. The main portion of the report contains a brief account of the progress of the work in a large proportion of the total number of estates under settlement, and is illustrated by three Appendices (A, B, and D), which show in tabular form the estates, whether Government, temporarily-settled, wards' or private estates, which are under survey and settlement during the year, the areas surveyed, the cost of survey and of settlement, the progress of survey and of recording and settling tenants' rents, the effect of the settlement on the rentals, and the names of the settlement officers under whose immediate control the settlements were conducted.

It is observed that the order of the different estates, as given in the Appendices and in the body of the report, is not uniform, and that they are not, moreover, arranged according to any strict geographical plan. In future an intelligent geographical order should be adopted both as regards the civil divisions and the districts and estates in those divisions, and the same order should be adhered to in the report itself and in each of the Appendices attached to it. Some definite principle should be laid down as to what settlements should be treated of in this report, and what should be omitted. In all riparian districts along the Ganges and Brahmaputra in Eastern Bengal, there are a great number of *chars* and islands, sometimes belonging to Government and sometimes to private owners, which are subject to diluviation and in which settlements are constantly going on. Some of these settlements in Dacca, Backergunge and Noakhali have been selected for inclusion in the Appendices or for mention in the report, and the majority are not included; but it is not clear on what principle this selection has been made. Again, it is also observed that in some instances estates entered in the Appendices have not been noticed in the report, but the grounds for this omission are not apparent. If it is not considered advisable to refer in the report to every settlement, the natural course, and that which should be adopted, would be to notice the larger and more important operations; but this does not appear to have been done in the present instance, where such small settlements as those of the Khosalpur estate in the Nuddea district, and of certain *chars* and small private estates in the Noakhali and Tipperah districts, have been selected for particular mention. The statements given in Appendices A and B should also be totalled for convenience.

3. With regard generally to the accounts of the different survey and settlement proceedings given in Chapter I of the Report, the Lieutenant-Governor would observe that it is not necessary that the report should deal with past history, as has been done in the present report in the cases of Angul (paragraph 5), Jalpaiguri (paragraph 17), Chittagong (paragraph 21), the Srinagar-Baneli Ward's Estates (paragraphs 42-44), the Dakhin Shabazpur Ward's Estate (paragraph 61), and other instances. What is required in the Director's report is a clear and sufficiently full account of what has been done and what has been spent during the year under report both on survey and on settlement; the name of the officer who was in charge of the settlement, as well as of his assistants, and their share in the work and the number of days spent by each away from head-quarters should be mentioned; and when the account of the work done consists in reporting the number of villages in which *khanapuri* was completed, or the number of ryots whose status was decided or whose rent determined, the figures should be referred to a common standard of progress, so as to enable Government to judge whether the settlement is in a satisfactory state of progress or not. An early opportunity will be found for carrying out these instructions. Orders have lately been issued in Government order No. 135T—R., dated the 18th June 1891, to the Board of Revenue, under which, in addition to the report, which is to be mainly financial and statistical, for the financial year ending the 31st March, and to be accompanied by the present agricultural part of the report, the Director will submit annually a further administrative report containing full information with regard to all surveys and settlements for the survey year ending the 30th September. Advantage should be taken of these orders to correct the shortcomings pointed out by this Resolution on the report now submitted. In a subsequent letter to the Board of Revenue, No. 455T—R., dated the 24th September 1891, detailed instructions have been given as to the nature of the information which is to be supplied by the Settlement Officers in their half-yearly Progress Reports, and which will be embodied in the Director's two reports.

4. The work of settlement is being carried out on a large scale in three tracts which are under the supervision of the Director—Orissa, Chittagong, and the Jalpaiguri Duars—as well as in a portion of the Sonthal Pergunnahs which is not under Mr. Finucane or the Board of Revenue. The history of the progress of these important settlements should be set in the forefront of the report.

5. *General survey and resettlement of Orissa.*—The progress made by Mr. Patterson's survey party has been rather disappointing. The expenditure on survey is given in the report and in Appendix A up to the end of June 1891; it should have been given to the end of the year under report, *i.e.* to the 31st March 1891. There are, moreover, discrepancies between the report and the Appendix A, as to the figures of the area surveyed up to and during the year. The report speaks of 360 square miles cadastrally surveyed in the Puri district in 1889-90, and 643 during 1890-91, or 1,003 in all; whereas Appendix A shows 549,003 acres, or 858 square miles, surveyed during 1890-91, and none in the previous year. The discrepancy is probably due to the confusion between the survey and the financial year. The Deputy Superintendent of Survey estimates that the cadastral survey of these 1,003 square miles, which was completed by the end of June 1891, has cost Rs. 139 per square mile, but apparently this estimate omits the cost of the traverse. The total expenditure on the 1,003 square miles is stated as Rs. 1,67,996, or about Rs. 165 per square mile.

The Settlement Officer, Mr. H. Reily, joined his appointment in February 1891, and the Assistant Settlement Officers at various later dates. During the remainder of the year their time was occupied in demarcating in advance for the survey party, testing the khanapuri, attesting areas of holdings, recording rights and existing rents, and making arrangements for utilising the kanungos, patwaris, and chaukidars of the country. The report states that the holdings of 11,734 tenants were attested and their rents recorded by the end of the year, and this seems a considerable amount of work, since settlement operations began so late in the year.

There is a further discrepancy between the report and the Appendix D, as to the number of Assistant Settlement Officers, the former showing 7 and the latter 8.

6. In Chittagong, survey and settlement have been going on in two parts—Old Thana Ramu and the Sudder sub-division. In the former, where work was begun in 1888, the survey of the whole area of 156,390 acres was completed, as well as the attestation of all the holdings in the 50 villages under the direct management of Government. The draft records of 40 villages were published, and of 12 villages finally published, but the final publication of the records of the remaining villages could not be made pending orders of Government as to the status to be assigned to the Noabad talukdars. Government has since issued orders on this point, under which they will be treated as tenure-holders. This part of the settlement was under Baboo Jogendro Kumar Bose, Assistant Settlement Officer, whose progress seems to have been satisfactory. The survey, which was finished before the year under report, cost annas 6-11 per acre and the settlement has cost annas 1-3 so far as it has gone.

7. The main strength of the staff was thrown into the Sudder sub-division, under Mr. Slack as Settlement Officer with a Covenanted Assistant, Mr. Allen, and three uncovenanted officers under him. The Professional Survey Department completed 1,448 square miles of traverse and 863 square miles of cadastral survey, out of a total area of 1,630 square miles, in the two years 1889-91. During the year 1889-90 the average cost of survey per acre was as high as 7 annas 9 pies, the reasons assigned being the small size of the plots, the high rate of wages, and the extreme complexity of tenures. With a view to reducing the cost of survey, the khasra writing was during the year under report made over to the Settlement Department, the result being that 308,480 acres were surveyed at a cost of Rs. 1,21,195, or an average of 5 annas and 4 pies per acre.

8. The settlement staff were mainly engaged in completing the survey records of 195 villages, and in demarcation and settlement of boundary disputes; but the rents and status of over 7,000 ryots were recorded during the year. Fuller information as to the work done by each officer individually will be looked for in the Administration Report. The total cost of survey and settlement up to the end of the year was Rs. 1,99,768, and the settlement has been estimated to result in an increase of revenue of Rs. 1,20,000.

9. *Jalpaiguri, Western Duars.*—The account of the year's work is again far too brief. The Lieutenant-Governor personally inspected the operations in April last, and it then appeared that the figures as to the survey given in paragraph 17 of the Director's report for the year 1889-90 were not quite correct. The report stated that in the season of 1889-90, 782 square miles had been traversed, and the 4-inch topographical survey of 118 square miles and cadastral survey of 304 square miles had been completed. The figures as given by Colonel Strahan, the Deputy Surveyor-General, showed, however, that during that season traverse had been completed of 730 square miles, cadastral survey of 275, and that no 4-inch topographical work had been done. The estimate of work turned out during 1890-91, as far as then known, was as follows:—

Cultivated	...	...	Traverse 92, cadastral 188.
Cultivable	...	...	Ditto 195, topographical 383.
Forest	...	...	Ditto 109, detail 150.

This left about 170 square miles to be surveyed topographically and 300 of forest detail to be completed.

The cadastral work showed the following results for 1890-91 :—

Pergunnah South Mainaguri—all the maps, amounting to about 1,200 in number, were finished and sent in.

Pergunnah North Mainaguri—out of 934 maps, 697 were finished and sent in.

Pergunnah Chengmari—out of 1,143 maps, 1,112 were finished and sent in.

All of these were expected to be in by the middle of April.

In Moraghat very few, and in West Madari no maps were sent in.

Many errors and defects were found in these maps and the accompanying records, and the Settlement Officer was much delayed in his proper work by the delay in completing them, and by the necessity of correcting them when sent in. He submitted a report on proposed settlement rates, on which orders were passed by Government, and he prepared during the year the assessment, in

accordance with those orders, on the larger part of the jotes in the South Mainaguri pergunnah.

10. The next class into which the operations of the Department may naturally be divided is the settlement of certain large scattered Government estates in different parts of the country. The only representatives of this class are Angul and Banki in Orissa, and as to the work done in these during the year, the report gives very little information. It appears from Appendix A that Rs. 13,928 were spent during the year partly on survey and partly on settlement in Angul, but there is nothing to show exactly what work was carried on, nor does the report show who was in charge of it. Appendix D should have shown this, if the report itself did not mention it; but it is observed that no settlement officer's name is entered for Angul in that Appendix.

As to Banki, where Rs. 5,003 were spent mostly in settlements during the year, the only details of work mentioned by the Director are as follows :—"The entries in the khatians and the new rentals were explained to the raiyats during the year and their signatures taken." There is nothing either in the report or in Appendix D to show under whom the work was carried on. The survey and settlement of the estate, which comprises 76,800 acres, were completed during the year at an average cost of 7 annas 10 pies per acre, the only important work remaining to be done being the reorganization of the surbarakari establishment. In their letter No. 644A, dated the 27th August 1891, the Board of Revenue have stated that the final report is still being awaited, nor has that report been yet received by Government. The Lieutenant-Governor regards this delay as very unsatisfactory.

11. Next come the small scattered Government estates, mostly *chars* or islands in the great rivers, which were never settled with any one, or which have fallen into the hands of the Government through default of their proprietors by reason of diluviation. As already mentioned, many of these exist in all the riverain districts, and it is not known why certain of these have been selected for description here. The largest collection of these appears to be the *Backergunge Government Estates.* The report with its Appendices exhibits great confusion as to the actual number of estates under settlement in this district. Excluding the Dakhin Shabazpur Estate, which is under the Court of Wards, Appendix A shows 31 estates under survey and settlement, there being nothing in the Appendix to show which of these are under Babu Piari Mohan Bose and which under Mr. Dwija Das Dutta. The body of the report mentions 39 estates as under the former Babu, viz. 4 under the Tenancy Act and 35 under the regulations, and 17 under the Tenancy Act as in charge of Mr. Dwija Das Dutta. Neither the figures in the Appendix A, nor those in the report, agree with those which were supplied to Sir Charles Elliott at his inspection of the Burisal office, on which occasion there were said to be 25 settlements pending under the Tenancy Act and 23 under the old regulations. Of these 48, 2 were represented as being under the Sub-divisional Officer of Bhola, 4 under the Sub-divisional Officer of Patuakhali, 9 under Sub-Deputy Collector Babu Akhil Chunder Roy, and 6 under Sub-Deputy Collector Babu Kali Prosad Chatterjee. None of these latter are, however, mentioned in the Director's report.

The Director should in his next report explain to Government the exact number of surveys and settlements pending in the Backergunge district, stating their names and the officer under whom each is placed.

12. *Government Estates in Midnapore.*—The report does not state, in the case of either of the two estates under settlement, what work was done during the year. In the case of the Bhetia estate it appears from Appendix A that Rs. 192 were spent, but it does not appear on what the expenditure was incurred; in Kamina Chak nothing was spent, and it is stated that settlement operations have been completed. It should have been reported whether anything, and if so what, was done.

13. *Government Estates in Nuddea.*—Out of 17 estates under survey and settlement during the year in the Nuddea district, only one, that of Khosalpur, is mentioned in the Director's report, and the information given as to that estate is altogether incorrect. The Director writes:—"This estate, containing 476 acres, was purchased by Government at a sale for arrears of revenue. The measurement was completed during the year at a cost of Rs. 137, or 4

annas and 7 pies per acre on the area surveyed." It appears, however, from the progress report for March 1891, submitted by the Collector of Nuddea, that the estate contains 13 villages, and therefore presumably more than 476 acres, and that up to the end of the year 1890-91 only 4 out of those 13 villages had been demarcated, and 1,440 bighas or 476 acres (this is apparently what was in the Director's mind), were cadastrally surveyed, the survey operations up to the end of the year having cost altogether Rs. 64-5-5. The progress of this survey, which is under Babu Hem Chunder Mitter, has been very unsatisfactory.

14 *Government Estates in Noakhali.*—Mention is made of three *chars* only in this district, namely, Pir Baksh, Char Ghazi and Char Fakira. No account is given to show what settlement work was carried out in estate Pir Baksh during the year, beyond a statement that an increase of Rs. 184 was obtained in the rental.

15. *Government Estates in Tipperah.*—The settlement of Government estate Jowar Baluakhandi, comprising an area of only 2,762 acres, took two years to complete under Babu Rajani Kumar Dutta, Deputy Collector. The progress appears to the Lieutenant-Governor to have been unduly slow. In pergunnah Singargaon Rs. 705 were spent during the year, the only work done being the decision of certain disputes about boundaries, and objections as to soil classification. No satisfactory explanation is given of the delay in the decision of these disputes, which had the effect of raising the average cost of survey and settlement to the abnormally high figure of 13 annas and 9 pies per acre.

16. The fourth important class of estates under the Settlement Department are those belonging to the Government Wards. One of the largest of these is the *Srinagar-Baneli Ward's Estate.* The report explains the method adopted of settling fair rents on the basis of existing rates, an allowance in the area being made for difference in the method of measurement and for more accurate survey; but no account is given to show in what actual work the Settlement Officer, Mr. Collin, was engaged during the year.

It appears that the settlement of 30 villages with an area of about 15 square miles was left pending at the close of the year owing to a dispute as to the standard of measurement, but it is understood that the matter has since been settled, and the submission of the final report, which has already been sent in to the Director, is now awaited by Government.

17. *Burdwan Raj Khas Mehals.*—In Sujamutha Rs. 10,252 were spent during the year on settlement, but here again very little information is given by the Director as to the work that was carried on. The Lieutenant-Governor inspected the settlement personally in the month of February last, and His Honour in a note recorded at the time expressed his dissatisfaction with the amount of work that had been done, and with the want of energy of the Settlement Officer, Mr. Dwijendra Lall Roy, who appeared to be under the mistaken impression that a Settlement Officer's camping season lasted only up to the month of March.

The sum of Rs. 8,133 was spent during the year on the settlement of the *Hukumápur Estate* under Babu Sukumar Haldar; but Appendix A shows nothing entered either against this estate or against Sujamutha as expenditure on survey from the commencement of the operations. An explanation of this should be submitted.

18. *Kanika Ward's Estate.*—Here also the Lieutenant-Governor notices a want of information as to what was done during the year. The report states that the survey was completed during the last year, by which is presumably meant the year 1889-90; whereas in Appendix A, 166,400 acres are entered as surveyed during 1890-91 at a cost of Rs. 33,165. The Lieutenant-Governor met the Settlement Officer, Mr. Srinath Dutt, during his visit to Orissa, and was obliged to find some fault with him for having conducted the work of attestation and settlement of rents at too long a distance from the villages concerned.

19. *Kujong Ward's Estate.*—The same discrepancy as to survey occurs in this case as in that of Kanika referred to above. The report states that the survey was completed last year, but the Appendix A shows Rs. 3,028 as expended on survey during 1890-91, although no area is entered as surveyed

during that year. Explanation of these discrepancies should be given. The total number of ryots in the estate is 36,085, and of these the rents of 14,512 were settled during the year; but it is not known, either from the report or Appendices, how many settlements were made up to 31st March 1890, nor, therefore, how much work remains to be done. From the fact that Rs. 6,007 were spent on settlement up to the 31st March 1890, it would appear that the rents of some raiyats had been settled previous to the year under report.

20. *Dinagepur Ward's Estates.*—These comprise the estates of the Wards of Sunkerpur, Churaman and Maldwar. Final reports have been received by Government in the case of all these estates, and Government Resolutions have already issued on the two latter. The report on the Sunkerpur estate is now under the consideration of Government.

21. *Dakhin Shabazpur Ward's Estate.*—Paragraph 61 of the report, which explains the reasons why settlement was determined on after the estate came under the Court of Wards in 1886, is not required.

The only account of the year's proceedings is contained in two lines of the report, which state that during the past cold weather the Settlement Officer, Babu Piari Mohan Bose, was engaged in completing the khanapuri which was left undone by the Survey Department. The Lieutenant-Governor does not consider this a satisfactory history of a year's work, there being nothing to show either how much work was done or what remains to be done.

22. *Serail Pergunnah Ward's Estate.*—The survey of the estate was completed during the year, and good progress was made in the settlement work by Babu Kali Sunker Sen, Settlement Officer, who settled fair rents for 1,410 tenants between December 1890 and the close of the financial year. The total area surveyed was 180,664 acres, at a cost of Rs. 1,21,298, giving a rate of over 10 annas and 8 pies per acre, not of 8 annas per acre as entered in column 16 of Appendix A. In arriving at the average for survey as 8 annas, the Director has apparently only taken into account the cost incurred in 1890-91, and not the previous cost, which amounted to Rs. 30,969. No explanation is given of this exceedingly high rate.

In the Serail pergunnah the lands of the villages are divided into what are locally known as "bandha" according to their bearing (north, west, south or east) from the villages, each "bandha" having a single prevailing rate. With regard to the Director's remark that this is one of the very few cases met with in settlement operations in Bengal, where a true prevailing rate exists, the Lieutenant-Governor believes that such a rate exists more often than is supposed, if the term "prevailing rate" is used in its true sense as a theoretical rate, which actual rates often agree with and always tend to approach. If a rate cannot be called a prevailing rate because a few exceptions are found, or if great accuracy is insisted on, then no doubt the Director's remark is true; but the Lieutenant-Governor does not use the term in that sense. In the Settlement Reports which have been submitted recently, he finds frequent reference to the theoretical existence of prevailing rates; and it is hardly conceivable that there should not have been one, although it may have been effaced or disguised by subsequent changes of area without change of rent.

23. The last class of estates which have come under settlement operations consists of those which belong to private proprietors and in which a record of rights is prepared under section 177 of the Tenancy Act, because of serious disputes between land-owners and the tenants. Mention is made in the report of such estates in four districts. The account of the year's work in the Dubalhati, Mollarpur, and Alakdia-Durgapur estates is meagre. There is nothing to show on what the expenditure of Rs. 17,381, shewn under settlement against the first of these estates, was incurred, nor what was done in Mollarpur besides the survey. In Alakdia-Durgapur no expenditure on settlement is shown up to the close of the year. The submission of the final report of the operations in the Dubalhati estate should be expedited.

24. *Maintenance of Records.*—The Director has only mentioned this important subject in the case of three settlements—those of the Angul and Banki estates in the Orissa Division, and of the Srinagar-Baneli Ward's estates. In the two former estates it is said that the sarbarakars will maintain and correct the records in accordance with rules which have been recently approved by the Board of Revenue.

In the Srinagar-Baneli Ward's estates the records will be kept up by the patwaris, 104 in number, of whom 48 have already obtained certificates of proficiency in surveying, while the rest are said to have received some training. This is so far satisfactory, but future reports should state what steps, if any, have been taken with a view to the maintenance of the village records in other estates in which settlement proceedings have been completed during the year or have approached completion.

PART II.—AGRICULTURAL ENQUIRIES, EXPERIMENTS, AND IMPROVEMENTS.

25. *Analysis of Districts.*—The Government Resolution, dated the 23rd September 1890, on the Director's report for the year 1889-90, noticed the completion by Mr. Bhupal Chundra Basu and Mr. Nogendra Nath Banerjee, the Director's Assistants, of the analysis of the two districts of Dacca and Lohardugga. During the year now reported on, Mr. Basu has been engaged on a similar analysis of the Nuddea district, while Mr. Banerjee has been making a tour of the district of Cuttack, on the agriculture of which he is now engaged in writing a report. The experimental farms at Sibpur, Burdwan, and Dumraon and other places have also been under the direct supervision of these officers.

26. *Emigration to Burma.*—The Director has given his attention to the question of emigration to Burma as a means of relief to the over-populated tracts of Behar and Chota Nagpore, and an agreement has been entered into with the British India Steam Navigation Company, under which that Company has undertaken to reduce the deck fare to Rangoon from Rs. 10 to Rs. 7-8, of which Rs. 2-8 will be paid by the Bengal Government as a subsidy, the balance being paid by the emigrants. It is hoped that local recruiting agencies will soon be opened in various parts of the tracts to be relieved.

27. *Arboriculture.*—With the exception of the planting of fruit trees along the road-sides, which must be regarded rather as an administrative measure adopted for shade purposes and the preservation of road alignments, than as an agricultural experiment, the arboricultural efforts of the department do not seem to have been extensive or productive of much practical good. The Lieutenant-Governor does not, for instance, see much use in planting date-palms where nature has not planted them, or in pushing artificially the cultivation of such trees as the *Eucalyptus*, *Divi-Divi*, or the *rain-tree*.

28. *Silk Experiments.*—The experiments at Berhampur, undertaken with a view to the mitigation of pebrine, were continued by Mr. Nitya Gopal Mukherjee under the direction of the Silk Committee. The information given in the report as to the objects and results of the out-stations opened at Pakhuria, Alipur, Nagri, and Kalimpong is, however, exceedingly vague, and gives no idea of what Mr. Mukherjee really did at these places during the year.

Since the close of the year it has been decided that the direct control of Mr. Mukherjee's work should be retransferred from the Silk Committee to the Director with a view to his giving more attention to the rearing of healthy silk at the out-stations. The experiments at Berhampur will nevertheless be continued, as also will those of Mr. Keighly in the Midnapore district, in the direction of detecting pebrine and other diseases without having recourse to microscopical examination.

29. *Experimental Farms.*—Agricultural experiments were carried on at the three experimental farms at Sibpur, Burdwan, and Dumraon, and also on a smaller scale in various Government, wards', and private estates in the divisions, especially of Burdwan, the Presidency, Rajshahye, Orissa, and Chota Nagpore, the principal products experimented on being paddy, wheat, potatoes, sugarcane, and fodder grasses.

With regard to paddy and wheat, the chief experiments were made at Dumraon, and were designed to test the relative merits of deep and shallow ploughing and of different kinds of manure, and, in the case of wheat, of well-water and canal-water. With transplanted paddy a mixture of crude saltpetre and linseed cake gave the heaviest outturn, and with broadcast paddy cowdung produced the best results, while deep-ploughing to a depth of four or five inches gave an increase in outturn of 24 seers of grain and 3 maunds 20 seers of straw per acre. Wheat appeared to be particularly benefited here by a manure of saltpetre alone or mixed with ashes, while in the Burdwan

farm bone-meal yielded a large increase. The extra yield obtained by irrigating the crop with well-water did not repay the extra expense as against that of canal-water. The largest outturn of potatoes was obtained at the Dumraon farm with green manures, but it is unfortunate that the outturn of the crops on the Burdwan farm is given per bigha, while that of Dumraon is given per acre, thus rendering comparison difficult. In future reports all outturns should be referred to a common standard. The uncertainty of all these experiments is exemplified by the fact that at Dumraon crude saltpetre applied to paddy failed this year to produce any increase in outturn, although in the preceding year it gave the best results of all manures; and also by the fact that, whereas in Sibpur the experiments in sugarcane showed a distinct advantage in favour of the *Saharanpur* as compared with the *Samsara* variety, the experiments in Burdwan produced a directly opposite result. Among fodder grasses *sorghum* and buffalo grass (*Reana luxurians*) were cultivated with great success at Sibpur. The latter grass gave an outturn of 192 maunds per bigha, and was sold at a net profit of 1 anna per maund.

30. *Agricultural Implements.*—Thirty-two wrought-iron Sibpur ploughs were issued during the year, and are said to have given satisfaction. A native gentleman in the Jessore district expressed an opinion that one ploughing with these instruments was as effective as four or five ploughings with the ordinary native plough. Some interesting experiments in the use of European butter-making machines were made in the Dharampur pergunnah of the Purneah district, by the late Mr. E. G. Williams, Manager of the Durbhunga Raj. The results of these experiments and of trials in other districts tended to show that the European methods might be adopted with advantage in the hills and in the districts bordering upon the hills, but that good results could not be obtained in districts where a temperature of under 75° Fahrenheit cannot be depended upon.

31. *Veterinary Establishment.*—The Director writes:—"The scheme for the establishment of a veterinary college is still under the consideration of Government. No progress appears to have been made in the matter during the year." Government was in fact awaiting the final decision of the Committee of the Sodepore Pinjrapole with respect to a suggested contribution from that institution towards the site and building expenses of the veterinary college. Since the close of the year to which the Director's report relates, Babu Shew Bux Bogla, one of the leading members of the Committee of the Pinjrapole, has generously offered a site and has contributed the sum of Rs. 30,000 towards the college and hospital, thus relieving the Pinjrapole Committee of the necessity of contributing. The work will now be proceeded with without further delay.

32. *Tour.*—Appendix H to the report shows that the Director's tours amounted to 134 days, divided as follows:—

	Days.		Days.
Orissa ...	... 32	Sonthal Pergunnahs ...	... 8
Chittagong ...	... 23	Sujamutha ...	... 7
Dacca Tipperah Dakhin Shabazpur	... 16	Hukumapur ...	... 5
		Silk enquiries in Midnapur district	... 4
		On tour with Dr. Voelcker	... 14
Srinagar-Baneli ...	... 9	Simla Conference ...	... 16

His Honour has no doubt that Mr. Finucane made great efforts to carry out his inspections effectively, but regrets that he was unable to visit the important settlement operations in the Jalpaiguri Duars during the year. He has been asked to propose a tour of inspection of all the important settlements for the coming season, and the programme will be finally settled on Mr. Finucane's return from leave, and after a decision has been arrived at as to the resumption of the Behar survey and settlement.

33. In conclusion, the Lieutenant-Governor wishes to record that, although the report reviewed above is not as complete and accurate in its details as he desires, he is satisfied that Mr. Finucane has shown ability and energy in his supervision of this important department, and in advising and controlling the settlement officers under his supervision, while he has at the same time paid

some attention to the considerable agricultural works which it is his duty to superintend.

Ordered that the Resolution be published in the *Calcutta Gazette*.

Ordered also that a copy of the Resolution be submitted to the Government of India in the Revenue and Agricultural Department for information, and that a copy be forwarded to the Board of Revenue, Lower Provinces, for information, guidance, and explanation on the several points noticed in the Resolution.

By order of the Lieutenant-Governor of Bengal,

C. E. BUCKLAND,

Offg. Secretary to the Govt. of Bengal.

No. 1136L.R.

COPY forwarded to the Secretary to the Board of Revenue, Lower Provinces, Land Revenue Department, for information and guidance.

No. 1137L.R.

COPY forwarded to the Appointment Department of this office for information.

No. 1138L.R.

COPY, with copy of the report, submitted to the Government of India, Revenue and Agricultural Department, for information.

No. 1139L.R.

COPY forwarded to the Director of the Department of Land Records and Agriculture, Bengal, for information and guidance.

By order of the Lieutenant-Governor of Bengal,

W. MAUDE,

Under-Secy. to the Govt. of Bengal.

CALCUTTA,
The 8th October 1891.

Reg. No. 4866C—1,121—22-10-91.

ANNUAL REPORT

OF THE

DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

BENGAL,

FOR THE YEAR ENDING 30TH SEPTEMBER 1891.

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Backergunge Government estates (see also appendices A, B, K, and L)	13	61
Badna (see also appendix B)	14	63
Bairagya (see also appendix B)	14	63
Banki (see also appendices A and B)	5	20
Burdwan Raj Khas Mahals (see also appendices A, B, and R)	20	76
Bhairav (see also appendix B)	14	63
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Belabaria (see also appendices A and B)	28	98(8)
Benagalsia (see also appendices A and B)	28	98(10)
Chandrail (see also appendix B)	14	63
Changrachak or Chowrachak No. 363 (see also appendices A and B)	28	98(6)
Chittagong Sadar subdivision (see also appendices A, B, F, G, and H)	6	26
Dacca Government estates	19	73
Dakhin Moyna (see also appendices A and B)	28	98(3)
Dakhin Shahbázpur Pargana in Backergunge (see also appendices A and B)	24	85
Drummond (see also appendix B)	14	63
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Fakira, Char (see also appendices A and B)	19	71
Fasson (see also appendix B)	14	63
Gazi, Char (see also appendices A and B)	19	71
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Goneshpura (see also appendix B)	14	63
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Gur Moyna (see also appendices A and B)	28	98(2)
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Hardinge (see also appendix B)	14	63
Hukumapur (see also appendices A, B, M, N, and R)	21	80
Jalpaiguri (see also appendices A, B, I, and J)	9	42
Jangla (see also appendix B)	14	63
Jowar Joymangal (see also appendices A and B)	19	73
Joynagar (see also appendix B)	14	63
Kalachand (see also appendix B)	14	63
Kali (see also appendix B)	14	63
Kanika (see also appendices A, B, W, and X)	27	95
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Khosalpur (see also appendices A and B)	19	75
Koralmara (see also appendix B)	14	63
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Kujanj (see also appendices A, B, U, and V)	27	94
Lakshmi (see also appendix B)	14	63
Lalmohan (see also appendix B)	14	63
Lamchi Koralmara (see also appendix B)	14	63
Lamchipata (see also appendix B)	14	63
Lord Hardinge (see also appendix B)	14	63
Madhupura (see also appendix B)	14	63
Maguri (see also appendices A and B)	28	98(11)
Maizurdi (see also appendices A and B)	18	68
Midnapore Government estates	19	74
Midnapore private estates	28	98
Mollarpore (see also appendices A, B, Y, and Z)	28	100
Nemuck Mahal (see also appendices A and B)	28	98(7)
Noakhali Government estates	19	70
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No. 394*TA.*

FROM M. FINUCANE, ESQ.,

Director of the Department of Land Records and Agriculture, Bengal,

TO THE SECRETARY TO THE BOARD OF REVENUE,

LOWER PROVINCES.

Dated Calcutta, the 18th March 1892.

SIR,

WITH reference to Government order No. 456TR, dated 24th September 1891, I have the honour to submit the annual report for the survey and settlement year 1st October 1890 to 30th September 1891. The Deputy Surveyor-General's annual reports have been received for the estates noted in the margin only. All of the Settlement Officers' reports were not received till the 8th February 1892, when the Dubalhati report reached my office. Mr. Reily has not sent an annual report for Orissa, but only a half-yearly report for the six months ending 30th September. He explains that as he only joined his appointment in February last, his half-yearly report, dated 28th November 1891, contains a history of the whole year's work. The tabular statements annexed to it do not, however, show the area surveyed and cost up to, and during, the survey-settlement year, but only the total area surveyed and expenditure incurred up to the end of March, and during the half-year from the end of March to the end of September 1891. Some other officers also failed to submit the annual reports called for, and have merely furnished brief accounts of the progress made up to, and during, the half-year ending 30th September 1891. The Deputy Surveyor-General's reports for Jalpaiguri, the Burdwan Raj khas mehals, Chittagong and Serail were received on the 11th, 13th, and 30th January, respectively, and his report for Orissa has not been received up to date. But Colonel Sandeman, recently, during my tour in Orissa, gave me a brief statement of the work done.

Jalpaiguri Western Duars.
Burdwan Raj Khas Mehals.
Chitagong and Serail.

2. In this report Government estates and temporarily-settled tracts under settlement of land revenue are first dealt with, then wards' estates, and afterwards permanently-settled estates. As regards Government estates and temporarily-settled tracts, the larger settlements of Orissa, Chittagong, and Jalpaiguri are put in the forefront of the report; other Government estates and temporarily-settled tracts follow in the order given in the margin; wards' and private estates are grouped in the Commissioners' Divisions to which they belong, and in the order followed in the Government's and the Board's Annual Administration Reports. As this is the first report of its kind called for, much difficulty has been experienced in getting the facts and figures from local officers. The report has had to be very hurriedly written, and errors and mistakes will probably be detected in the figures furnished; but it is hoped that in future years, timely notice having been given of what is required, these difficulties will disappear, and that the report will be submitted on the due date. Petty settlements carried on under the Regulations, and surveys and settlements of some small estates ordered by Commissioners and Collectors under section 103 of the Tenancy Act, are not included in this report.

Backergunge.
Tippera.
Noakhali.
Dacca.
Midnapore.
Nadia.

GOVERNMENT ESTATES AND TEMPORARILY-SETTLED TRACTS.

ORISSA DIVISION.

Orissa.

3. Mr. Reily in his letter of the 28th November 1891 submitted a report of the progress made in survey and settlement for the half-year ending 30th September 1891. As he joined his appointment on the 16th of February, he has, he explains, dealt in his half-yearly report with the entire work from the date he took over charge, and has not, therefore, submitted a separate annual report. The survey report for Orissa has not been received from the Survey Department. The total area surveyed cadastrally up to the 30th of September 1891 was 1,048 square miles. Of this 361 square miles were surveyed before the 30th September 1890 and 687 square miles during the survey and settlement year under report. The total expenditure on survey to the end of the year was, according to the settlement officer, Rs. 2,19,031.

4. *Settlement.*—Mr. Reily joined his appointment as Settlement Officer on the 16th February 1891, and remained in charge during the year.

5. The circle head-quarters of each of the Assistant Settlement Officers, the names of the officers who were in charge, and the number of days each officer was absent from his head-quarters, are reported by the Settlement Officer to be as follows:—

DISTRICT.	Name of circle.	Head-quarters of Assistant Settlement Officers.	Officers who have held charge.
Cuttack ...	Tangi ...	Tangi ...	Babu Chakulal Sirkar from April to 13th July 1891. Ambica Charan Sen from 14th July to 3rd August 1891. Babu Chakulal Sirkar from 4th August to 3rd September 1891, and Ambica Charan Sen from 4th to 30th September 1891.
Ditto ...	Jagatsingpur	Jagatsingpur	Ernest Herbert Cooper Walsh was in charge from April to 5th May 1891. James Taylor from 18th May to 9th September 1891. Babu Harish Chunder Roy from 10th to 30th September 1891.
Puri ...	Rahang ...	Puri ...	Barada Charan Mitra from 8th March to 5th May 1891. Ernest Herbert Cooper Walsh was in charge from 6th May to 30th September 1891.
Do. ...	Karmala ...	Karmala ...	Tahuruddin Ahmed from 8th March to 30th September 1891.
Do. ...	Lembai and Kotrang.	Kanti ...	Debendranath Mukerjee to 13th July 1891. Babu Chakulal Sirkar from 14th July to 3rd August 1891. Debendra Nath Mukerjee from 4th to 21st August 1891. Ernest Herbert Cooper Walsh from 22nd August to 30th September 1891.
Do. ...	Pipli ...	Pipli ...	Surjakumar Agasti from 30th March to 16th August 1891, and Ernest Herbert Cooper Walsh from 22nd August to 30th September 1891.

6. The following statement shows the number of days each officer was absent from head-quarters on tour:—

Name of Circle.	Name of Officer.	Number of days the officer was absent on tour from head-quarters.	Remarks.
Jagatsingpur ...	Ernest Herbert Cooper Walsh	28 days.	
	James Taylor ..	13 „	
	Babu Harish Chunder Roy ..	10 „	
		51 days.	
Tangi ...	Chakulal Sirkar ...	43 days.	
	Ambica Charan Sen ...	22 „	Was in charge of the Settlement office during the absence of the Settlement Officer.
		65 days.	
Rahang ...	Barada Charan Mitra ...	11 days.	
	Ernest Herbert Cooper Walsh	70 „	
		81 days.	
Serai and Chowbiskud.	Tahuruddin Ahmed ...	148 days.	
Lembai and Kotrang	Chakulal Sirkar ...	31 days.	
	Debendranath Mukerjee ...	108 „	
		139 days.	
Pipli ...	Surjakumar Agasti ...	83 days.	
Settlement Officer...	Herbert Reade Reily ...	83 days.	

7. Mr. Reily has not given the number of villages and the area comprised in each of these circles, but from information recently furnished during my tour of inspection, it appears that the arrangement of circles now is as follows:—

Name of Officer.	Name of Circle.	Sq. miles.	No. of plots.
Mr. Ambica Charan Sen ...	Tangi	130	209,000
„ Tahiruddin Ahmed ...	Jagatsingpur ...	192	285,223
„ C. A. Radice	Karmala	167	133,600
„ E. H. Walsh	Kantie	144	276,480
„ R. Nathan	Rahang	148	169,440
	Pipli	155	396,800
	Kodhar	111	90,000
		1,047	1,560,543

These circles have been re-arranged thus:—

Name of Circle.	Name of Officer.	Area in square miles.
1. Rahang ... Karmala ...	Mr. E. H. Walsh ... ... „ Tahiruddin Ahmed ...	315
2. Kotrang ...	„ Baroda Charan Mitra ...	72
3. Lembai ...	„ C. A. Radice	72
4. Pipli	„ R. Nathan ... ... Babu Mohendra Nath Seal ...	266
5. Jagatsingpur ...	Mr. P. C. Lyon ... ... Babu Chandra Nath Ghose ...	191
6. Tangi... ...	Mr. Ambica Charan Sen ...	130

8. *Demarcation.*—The Settlement Officer has not reported the area demarcated during the year. He says that he was able to get 852 square miles demarcated and ready by the date of his report, and expected to have a further area of 858 square miles ready by the 31st of December 1891. The Survey Department will in future undertake any demarcation that is required.

9. *Attestation, Fixation of Rents, &c.*—The number of tenants whose status had been determined up to the close of the year is 29,190, the number of plots attested being 138,042, and the area attested in acres 83,752. The average number of plots attested daily in Rahang is reported to be 139 ; in Lembai and Kotrang 480; in Karmala 530; in Tangi 317; and in Jagatsingpur 463; but it is not possible to ascertain from the Settlement Officer's report the average daily number attested by each Assistant Settlement Officer. The work of attestation was, it is said, delayed by errors and inaccuracies of the khasras prepared by the Survey Department. Under the survey rules *parchas* or jamabandi slips should have been given to the raiyats at the time of survey, as they were given in Muzaffarpur, Srinagar, and elsewhere, but the rule on this point seems to have been overlooked by Mr. Patterson in Orissa.

10. Jamabandi slips are now being distributed among the tenants. The work of attestation will, it is hoped, thereby be expedited. The average standard number of plots expected to be attested daily by each Assistant Settlement Officer in Chittagang is 600. The complication of tenures and the difficulties in attestation are far greater in Chittagong than they are in Orissa; and if the khasras are prepared with care, there is no reason why a much larger number should not be attested by each officer in Orissa than has hitherto been reached.

11. *Fixation of Rent.*—No rents were settled during the year. The Settlement Officer reports that the existing rents have been recorded for 29,190 tenants holding an area of 83,752 acres. The rental given for these tenants according to " previous jamabandi " is Rs. 59,284, or on an average between 11 and 12 annas an acre. These figures are manifestly incorrect, the average rate of the existing rent in Orissa being known to be two to three rupees an acre or more.

12. *Assessment of Land Revenue.*—No assessment of land revenue has yet been made.

13. *Patwáris.*—There are, the Settlement Officer reports, 464 patwáris in Orissa, distributed as follows:—

Cuttack	100
Puri	308
Balasore	56
Total ...	464

Of this number 277 were trained in survey:—

Cuttack	64
Puri	181
Balasore	32
Total ...	277

14. Mr. Reily reports that even though the services of patwáris are got free, the cost of the area surveyed by them is almost double that surveyed by the fully paid agency of amíns. This is due to the fact that the same number of chainmen is required in either case, whether the services of a patwári or those of a professional amín are utilised, and while the patwári surveys from 3 to 4 acres a day, a professional amín will survey from 10 to 16 acres; hence the cost of the chainmen is more than doubled when patwáris' services are utilised in the survey. The Settlement Officer proposes, therefore, to dispense with the patwáris' services in survey, and to utilise more competent local men who have been trained to survey, and can turn out a larger area. When the survey and settlement is completed, he would dismiss the present staff of patwáris, and substitute for them selected Ooriya amíns, who may have done well during the course of the survey operations. The objection to the adoption of this course would be, that the new men so appointed would be strangers in their

several circles, and probably would not be acceptable to the raiyats and zamindars.

15. *Kánungoes.*—There are 25 kánungoes in Cuttack, 12 in Puri, and 12 in Balasore. The kánungoes in Puri were made over to the Settlement Officer in May last, and have since been employed in survey and settlement work. In Cuttack the kánungoes had not been made over to the Settlement Officer at the date of his report, but have since then been placed under him. In Balasore as there was no survey work in progress during the year, the services of the kánungoes were not required by the Settlement Officer.

16. *Boundary disputes.*—The total number of boundary disputes which arose in Cuttack and Puri was 1,039. Of these, 729 were settled during the year, and 310 remained at end of the year. In addition to the 1,039 boundary disputes filed at the time of cadastral survey, 717 disputes were reported by the Demarcation Inspector.

Cuttack	...	132
Puri	...	907
		1,039

17. I visited Orissa twice during the year under report, and spent 12 days there on each occasion. On the first occasion, in communication with Mr. Reily, I drew up a detailed programme of work and estimates, and arranged for the employment of patwáris and kánungoes, and the utilization of the services of chaukidars as chainmen. The work of attestation and settlement had not then begun. At the time of my second visit during the rains, attestation work and the preparation of soil-class maps were not in progress. I was therefore unable at that time to pronounce an opinion as to the merits of the work being done, but I have again recently visited Orissa and recorded my opinion on the character and progress of the work in notes which have lately been submitted to the Board.

18. *Cost.*—The total expenditure on settlement during the year was Rs. 45,598. The expenditure on survey during the survey and settlement year, 1st October 1890 to 30th September 1891, has not been reported.

Angul.

19. The Tahsildar of Angul, Babu Narayan Chandra Naik, has not submitted an annual report showing what remained to be done at the end of September 1890, and what was done during the year. His final report was received since the close of the year, and has been submitted to the Board. The assessment of the entire estate was made before the beginning of the year under report, and jamabandis were published; but Government having ordered in August 1890 that lands brought into cultivation within the period of last settlement should be assessed at half the full rates for the first five years, at three-quarter rates for the next five years, and then at the full rates for a further period of five years, the khatians had to be revised and explained again to the raiyats. This work was done during the year under report. Khatians were corrected in accordance with the orders of Government, and raiyats' signatures were taken upon them. Sub-Deputy-Collector Babu Chaku Lal Sircar and the Tahsildar, Babu Narayan Chandra Naik, were each in independent charge of five parganas. Babu Chaku Lal Sircar completed his circle in January 1891, when he was transferred to Cuttack. The tahsildar also completed the revision of jamabandis and the explanation of them to the raiyats of his circle during the year, and took their signatures to the khatians. Fair copies of the khatians were prepared and distributed amongst the raiyats, and another copy is being made for record in the tahsildar's office. The new jamabandis will take effect from the beginning of the year 1892. Kabuliyats cannot be taken from the sarbaráhkárs until the questions of the percentage to be allowed to them and the form of kabuliyat are settled by Government. The expenditure on settlement from the beginning of the operations to the end of the year is Rs. 54,140. The Settlement Officer estimates that a further expenditure of Rs. 7,304 will have to be incurred in making fair copies of the records for his office and taking kabuliyats from the sarbarákárs.

Banki.

20. The survey and settlement of this estate has been completed, as stated in paragraphs 12 and 13 of my Annual Report for the year ending March 1891. The Settlement Officer, Babu Balaram Das, has submitted a very incomplete

report of the work done during the year. He says that several objections remained undisposed of at the end of the previous year, and that further objections were made after publication of the draft records, so that the final preparation of the records was not completed before the end of the year 1891. The objections, however, have now been disposed of, and the records are being corrected and copied. The final report was promised in February 1892, but has not been received up to date. The following statement shows the number of objections disposed of during the period under report:—

Pending from previous year ending 30th September 1890.	Instituted from 1st October 1890 to 31st March 1891.	Total.	Disposed of from 1st October 1890 to 31st March 1891.	Pending on 1st April 1891.	Instituted from 1st April to 30th September 1891.	Total.	Disposed of from 1st April 1891 to 30th September 1891.	Pending on 1st October 1891.	Remarks.
246	614	860	483	377	118	495	456	39	

21. The Settlement Officer, who is also tahsildar of Banki, ceased to draw settlement allowance from the end of March 1891. The delay in the submission of his final report is, he says, due to the necessity of making enquiries on objections raised to the records as published. The total expenditure during the year on settlement work was Rs. 1,678.

22. The total number of tenants whose rents were recorded, and for whom fair rents were settled during the year, is 2,047.

23. I visited Banki on two occasions while the survey and settlement proceedings were in progress, and examined the khasras and khatians on the ground. They appeared to me to have been carefully prepared.

24. An estimate for a non-professional survey and for the settlement of Banki, amounting to Rs. 1,64,411, was submitted by the local authorities before I took charge of the work. This estimate was revised by me and reduced to Rs. 40,000. The actual cost for a professional survey has been Rs. 25,097, and for settlement Rs. 12,598; total Rs. 37,695, the increase of revenue obtained being Rs. 7,974.

Maintenance of record.

25. A scheme for the reorganisation of the sarbaráhkárs' establishment with draft rules for their guidance was submitted after the close of the year, and was sanctioned by the Board. There were previously 143 circles with 195 sarbaráhkárs. The number of circles has been reduced to 75 and the number of sarbaráhkárs to 100. The records will be kept corrected by them under rules which have been approved by the Board.

Chittagong Division.

Chittagong Sadar Subdivision.

26. Mr. Slack was in charge of the Chittagong settlement office until 11th of July, when, on being deputed to act as District and Sessions Judge of Chittagong, he was relieved by Mr. C. G. H. Allen, who remained in charge till the end of the year. Mr. Slack was out in camp for 141 days, and Mr. Allen for 4 days of the period during which he was in charge of the settlement office.

27. The Settlement Officer's time was employed in looking after the staff of khanapuri amíns, in inspecting the offices of the assistants, and supervising the work of the khasra office, where the khatian and various other forms were written up.

28. Mr. C. G. H. Allen, Covenanted Deputy Collector, joined as an Assistant Settlement Officer on the 2nd March 1891. Up to the 23rd of April he was engaged in learning survey work, and from that date till the 11th of July was employed on settlement duty. Between the two latter dates Mr. Allen spent 2 months and 17 days in camp, and was in charge of the South Banskhali and Anwara-Parki circles. These circles comprise an area of 81·8

square miles, of which the attestation of 15 villages, comprising an area of 31 square miles, was done during the year by Mr. Allen, who also disposed of 245 cases, and occasionally helped the Settlement Officer in inspecting khanapuri amíns working near his camp.

29. From the 11th of July to the close of the year Mr. Allen acted as Settlement Officer, and besides supervising the work of the khasrá office, also aided in the general administration of the district by disposing of such criminal cases as were made over to him.

30. Mr. Atul Krishna Rai joined as an Assistant Settlement Officer on the 31st of January last; but, having done a month's attestation work in the Belgaon Circle, he fell ill and left. His place was filled on the 1st of April by Babu Durga Charan Ghose, who was deputed to act as an Assistant Settlement Officer. His circle covers an area of 70 square miles. Babu Durga Charan Ghose, besides disposing of 1,308 cases, did the attestation of 22·3 square miles in 26 villages. Up to the 12th of July, when the Babu returned to head-quarters, 3 months and 12 days were spent by him in camp. On the 12th of July, Babu Durga Charan Ghose reverted to general duty, but continued, in addition to his other work, to supervise his settlement establishment who were engaged in correcting the records, in accordance with the orders passed at attestation time, and in collecting the various figures needed for the preparation of fair-rent decisions.

31. Babu Romesh Chunder Das arrived at Chittagong on the 24th of January 1891; since that time he has been in charge as Assistant Settlement Officer of the Satkania Circle, a tract covering an area of 271 square miles. During the year he was in camp 165 days, and attested in that period 54,487 plots, besides disposing of a large number of cases. On the 16th of July this officer returned to head-quarters, and from that date till the end of the year, he acted as the Settlement Officer's (Mr. Allen's) Personal Assistant.

32. Since receipt of his annual report, the Settlement Officer has rearranged the circles thus:—

Number of villages in circle.	Name of Circle.	Name of officer in charge of circle.	Area in square miles.	Total number of plots.
66	Anwara ...	Babu Jogendra Chandra Chakarvarti.	37·7	98,080
48	Belgaon ...	Babu Durga Churn Ghose ...	67	134,579
14	Jaldi ...	Mr. Allen (this circle is to be given to Babu Durga Churn Ghose).	50·2	63,110
99	North Satkania (Satkania 93, Puttia 22·4).	Babu Romesh Chander Das ...	115·4	210,735
35	South Satkania ...	Babu Surat Chandra Das ...	95·5	122,568
110	West Puttia ...	Babu Kanti Chandra Mukerjee	74·1	197,901
89	East Puttia ...	New officer to be appointed ...	61·2	169,612
50	Ramoo ...	Babu Jogendra Kumar Ghose ...	245·97	108,797

33. *Progress of*—

(*a*) *Demarcation.*—The demarcation of the Sadar subdivision, with the exception of the hilly portions, which could not be conveniently assigned to the neighbouring villages until the topographical survey of them had been done, was finished during the year under report. The work actually done during the year comprised the demarcation of 465 villages in thánas Hathazari, Fatikchari, Raojan, Town, Kumira, and Mirkasarai.

(*b*) *Survey.*—In the Sadar subdivision there is an area of 1,626 square miles, of which 1,262 was estimated to require cadastral and 364 topographical survey. Up to the beginning of the year, 380 square miles had been cadastrally surveyed, and during the year under report a further area of 348 square miles, as well as 112 square miles of topographical work; but the latter will require some revision. The survey of the village sites, owing partly to the amín's misconduct and partly to intricacy of the plots, was in several instances full of errors, and khanapuri was on this account to some extent delayed.

In the present season the Survey Department has, according to the Settlement Officer, to complete the cadastral survey of 534 square miles, the

topographical survey of 252 square miles, the revision of 112 square miles of topographical work, and the traverse of—

(i) the main circuit along the coast down to the town of Chittagong and the south bank of the Fenny river;
(ii) some 15 miles of the Fatikchari thána boundary;
(iii) few villages near the town of Chittagong; and
(iv) a portion of the boundary of the proposed forest reserve.

Originally it was expected that the survey of the Sadar subdivision would be completed by the end of this official year; but owing to increase in the area for cadastral survey, more time will be required. The cadastral work was practically finished in thánas Banskhali, Satkania, and Patya, save in two villages, while portions of thánas Raojan and Hathazari were done.

The Settlement Officer arranged with the officer in charge of the Survey party that this season's cadastral work be begun simultaneously in each of the remaining thánas, and that each sheet as it is done be sent to him and not kept till the whole village is finished. In this way he hopes to have work ready for his assistants when the circles south of the Karnafuli are finished, and also to get large villages ready more promptly than has hitherto been the case.

(*c*) *Receipt of records.*—Up to the 1st of January the work of preparing the records required for attestation in the Sadar subdivision was done by the Survey Department, but after that date it was made over to the Settlement Officer, and the Survey Department has now merely—

(i) to supply maps for the khanapuri amíns to use when preparing the khasra;
(ii) to furnish the areas of all plots;
(iii) to ink maps the khanapuri of which has been done;
(iv) to supply traces of such maps.

Before the beginning of the year the Survey Department had prepared and handed over the records of 36 villages, comprising an area of 15·9 square miles. During the year the records of 212 villages, with an area of 205·8 square miles, were prepared and handed over for settlement work.

(*d*) *Khanapuri.*—During the year the khanapuri of 477,682 plots was completed and the entries (previously done by the Survey Department) regarding 306,463 plots were revised. The staff employed by the Settlement Officer on this work consisted on an average 120 amíns under 11 Inspectors. Taken as a body, the average daily outturn of each amín came only to 31 plots.

(*e*) *Fixation of rent, determination of existing rent, decision of fair rent.*—The existing rents were recorded and the status determined of 33,679 tenants during the year in the Sadar subdivision. No fair-rent decisions were passed.

(*f*) *Assessment of Land Revenue.*—No assessment of land revenue was made in the Sadar subdivision during the year.

34. *Training and utilization of patwáris, kánungoes and other local officers.*—There are no local village officials in Chittagong who can be utilised in keeping up the records, but a scheme has lately been sanctioned by Government under which the khas tehsil establishment will be strengthened and utilised for this purpose.

Old Thána Ramoo in Chittagong.

35. *Survey.*—The survey of Old Thána Ramoo was completed before the beginning of the year.

36. *Settlement.*—The settlement work was in charge of Babu Durga Charan Ghose up to the 4th of November, when he was relieved by Babu Jogendra Kumar Bose, who remained in charge up to the end of the year. The number of days spent in camp during the year by the officer in charge of this tract was 332.

37. The work performed by Babu Jogendra Kumar Bose consisted in completing the attestation (which was finished in May last), in deciding disputes, and preparing the necessary figures for fair-rent decisions. Within the period under report the following work was done:—

(i) The entries regarding the lands held by 15,389 tenants were attested.

(ii) Five hundred and fifty-eight original suits and 1,062 objections were disposed of.

(iii) Eight fair-rent decisions were passed.

38. Altogether fair-rent decisions have been passed in 43 of the 50 villages in Ramoo. According to these decisions the revenue and rental of tenants paying direct to Government, inclusive of talukdars, would have increased from Rs. 53,657 to Rs. 90,126. Soil-class maps are now, in accordance with the orders of His Honour the Lieutenant-Governor, being prepared, average rates for blocks of homogenous quality are being struck, and statements are being made out showing what the revenue would be according to these average soil-class rates. I visited Chittagong twice during the year, spending 13 days on the first and 10 on the second occasion, and examined the work of khanapuri being done by the Settlement Officer, and the work of attestation on the ground. Both appeared to me to be done with thoroughness and care. Some of the fair-rent decisions passed by Babu Durga Churn Ghose were also read by me, and appeared to me to be sound.

39. The standard of work expected in Chittagong is—

(*a*) 30 plots daily of khanapuri by each amín;

(*b*) 600 plots attestation by each Assistant Settlement Officer;

(*c*) preparation of soil-class maps, two square miles a day, by an Assistant Settlement Officer.

40. *Cost.*—The total expenditure in the Sadar subdivision during the year was—

	Rs.
Survey	1,32,540
Settlement	58,892

41. In Ramoo there was no expenditure on survey. The settlement expenditure was Rs. 15,389.

Rajshahi Division.

Jalpaiguri.

42. The survey of the Duars commenced in November 1888, and the settlement work commenced at the end of November 1890. Up to the end of the year under report an area of 486,016 acres was cadastrally surveyed, and the records of 3,430 jotes were made over to the Settlement Officer by the survey party. An area of 162,063 acres comprised in 3,507 jotes in the Mynaguri tahsil was assessed during the year, and resulted in an increase of Rs. 36,210 in the revenue. The total expenditure on survey from the beginning of the operations to the end of the year was Rs. 3,26,109 and on settlement Rs. 62,685, out of which sums Rs. 1,10,784 and Rs. 30,459 respectively were expended during the year ending 30th September 1891. The following table shows the names of Settlement and Assistant Settlement Officers employed during the year:—

Name of Officer and designation.	Period employed.		Remarks.
	From	To	
Mr. Donald Sunder, Settlement Officer.	1st October 1890	30th September 1891...	Joined 20th January 1890.
Babu Haris Chandra Rai, 2nd Settlement Officer.	5th November 1890...	28th February 1891 ...	Joined 5th November 1890.
	1st June 1891 ...	24th August 1891 ...	
Babu Ram Chandra Sen, Acting 2nd Settlement Officer.	1st March 1891 ...	31st May 1891 ...	Joined 1st March 1891.
Babu Rash Mohan Chandra, Assistant Settlement Officer.	6th November 1890...	22nd September 1891	Joined 6th November 1890.
Babu Upendra Chandra Mukerjea, Assistant Settlement Officer.	17th September 1891...	30th September 1891...	Joined 17th September 1891.
Babu Jadub Chandra Mozumdar, Assistant Settlement Officer.	21st September 1891 ...	Ditto	Joined 21st September 1891.
Babu Harilal Gupta ...	23rd September 1891...	Ditto	Joined 23rd September 1891.

43. The settlement work was under the charge of Mr. Sunder throughout the year. Babu Chandra Kant Ganguli, who was his first Assistant, having taken furlough, the post which he held was abolished and two other assistants were appointed in his place. One of these, Babu Haris Chandra Rai, was designated 2nd Settlement Officer, and the other, Babu Rash Mohan Chandra, Assistant Settlement Officer. Babu Haris Chandra Rai reported himself to Mr. Sunder on 5th November 1890, and was employed up to 7th December in the Settlement Office. On the 8th December he was deputed to demarcate the boundary between Bhutan and Jalpaiguri; he was engaged on this work up to 1st March 1891, when his health failed, and he proceeded on sick leave. He was succeeded by Babu Ram Chandra Sen, who completed the demarcation work, and thereafter was employed on attestation, and on classification of soils of jotes in two taluks of pargana North Mynaguri of Mynaguri tahsil. Not being acquainted with English, he was of little use, as he was not able to write notes on the jotes which he had inspected. On June 1st, 1891, he was relieved by Babu Haris Chandra Rai, who was sent to pargana North Mynaguri, and was employed there in checking classification of soils of jotes and in attestation work; but he frequently complained of being ill from fever and unfit for duty, and had to be transferred to Orissa on 24th August 1891. The other officer, Babu Rash Mohan Chandra, shortly after his appointment suffered from illness which prevented his being employed in the mufassal. On 17th April 1891 he was sent out to attend to attestation work and checking of khanapuri in taluk Haihaipathar, of pargana North Mynaguri; but failed, owing to illness, to do anything, and returned to Jalpaiguri on 12th May 1891. He was sent out again on 21st May 1891, but again became ill of fever and returned to the Settlement Officer's camp at Kyranti on 5th June 1891, and was employed from 6th to 14th June 1891 in helping to complete the attestation work in parganas Chengmari and North Mynaguri. On 15th June 1891 he returned to Jalpaiguri, and was employed on general work in the office up to 20th August 1891, when he was sent to taluk Baradigi, of pargana North Mynaguri, to check classification of soils and complete attestation work of some jotes. He returned to head-quarters on 5th September 1891 and did no work after that, as he complained of being ill from fever. He availed himself of leave without pay on 22nd September 1891, and has now been sent to Dinajpur as Sub-Deputy Collector in the regular line.

44. Since the transfer of the above-named officers, three new men have been appointed to fill their places, viz., Babu Upendra Chandra Mukerjea, who was Income-tax Assessor of Dinajpur; Babu Jadub Chandra Mozumdar, who was a kánungo at Rampur Boalia; and Babu Harilal Gupta, who was a clerk in the office of the Commissioner of the Rajshahi Division. None of these officers, the Settlement Officer reports, know anything of settlement work or of the Western Duars, but they are learning, and are now employed in pargana Moraghat in collecting information to enable the Settlement Officer to furnish a report as to the rates which should be adopted for jotes in Falakata tahsil. The attestation of jotedars' and chukanidars' holdings, and the work of recording their rights, in the three parganas of the Mynaguri tahsil, was completed by 28th June 1891, when the Settlement Officer returned to Jalpaiguri.

45. No work was done in the mufassal between 1st and 15th April 1891. Cholera then broke out in the Duars and compelled the staff to return to head-quarters. Out of a camp of about fifty men, twelve men died of cholera and fever in the first fortnight of April, and from then up to the time of their return to head-quarters, work was carried on under very trying circumstances, and with much difficulty. The rains commenced early in May 1891, and repeated attacks of fever so seriously affected the health of most of the muharrirs in camp, that it was found impossible to keep them out after 20th June 1891.

46. *Tours.*—The Settlement Officer was on tour for 217 days during the year; Babu Haris Chandra Rai was out for 141 days; Babu Ram Chandra Sen was out for 87 days; Babu Rash Mohan Chandra was out for 90 days; Babu Upendra Chandra Mukerjea was out for 10 days, and Babu Jadub Chandra Mozumdar for 7 days.

47. *Attestation.*—The entries in the records relating to holdings of 11,890 jotedars and 5,089 chukanidars were explained to the jotedars, and they were also informed what land is in possession of 11,392 adhiars who are under them. Three thousand five hundred and seven jotes, covering 162,063·39 acres of land in 71 taluks of parganas North Mynaguri, Chengmari, and South Mynaguri, were inspected, and attestation of the holdings of the above-mentioned jotedars and chukanidars was completed in camp. It was not possible to complete in camp the calculation of the Government revenue payable on account of *all* the jotes, or to announce to *every* jotedar and chukanidar the amount of the increased revenue and rent. A portion of this work had to be done at head-quarters during the recess, and printed notices, with extracts from the khatians, are now being issued to jotedars, showing (1) how much land they had at last settlement, (2) the revenue paid for it, (3) how much land they have by the present settlement, (4) what amount of revenue they will have to pay, and (5) steps by which the revenue payable by present settlement, when it is progressive, will rise.

48. *Demarcation.*—The total number of jotes demarcated during the year was 2,863. The work of demarcation was done by a native surveyor, who was asssted by a staff of 16 amíns. All the demarcation papers required by the Survey Department were furnished to that Department, taluk by taluk, as soon as finished. In some cases jotes which had been demarcated during the previous year had to be redemarcated during the year under report, as the earthen mounds which the amíns had erected had been washed away or covered by jungle and grass, and could not be found by the Survey Department. In consequence of cholera and much sickness among the amíns of the Survey Department, many jotes which were demarcated could not be measured.

49. *Survey.*—The total area surveyed during the year, according to Mr. Hanby's report, is as follows:—

	Acres.
(*a*) Surveyed and "khanapuried"	149,711
(*b*) Khasras completed of area remaining from last year's survey, 26,691 acres	...
(*c*) Revision survey of area surveyed previously, which had to be surveyed owing to changes caused by silting from the Tista river and to errors	9,507
	159,218

50. The area that remained for cadastral survey at the close of the year is reported by the Survey Officer to be 6 miles, but the Settlement Officer says that the traverse survey of two blocks of land, covering 58,679 acres, or about 91 square miles, in Falakata tahsil, also remained to be done. These blocks of land contain several jotes which will have to be cadastrally surveyed. Traverse survey of about 600 acres of land in taluks Sesuabari and Morichbari of pargana South Mynaguri will have to be made, and cultivation therein will have to be cadastrally surveyed. Several jotes in parganas North Mynaguri and Chengmari were omitted from survey, and will have to be done. All that remains unfinished will, it is believed, be completed by the Survey Department during the present cold season.

51. *Receipt of records from the Survey Department.*—The records of 3,430 jotes were received from the Survey Department during the year under report. These were records of the Falakata as well as of the Mynaguri tahsils. In some cases the records were, the Settlement Officer reports, carelessly prepared, and had to be returned to the Survey Department for revision. Great delay and trouble was thus caused in the Settlement office in dealing with some of the records supplied by the Survey Department. In several cases figures given in chittas against the name of a person were found to disagree with those entered in the khatians in the name of the same person, and the totals contained in the abstracts were found to be wrong.

52. *Boundary disputes.*—Five hundred and nineteen boundary disputes were pending at the commencement of the year, and 835 fresh cases were received from the Survey Department during the year. Of these, 848 cases were

disposed of, leaving 506 cases in Falakata, Alipur, and Bhalka pending at the close of the year. The majority of the cases disposed of related to streams and roads, which the Survey Department were directed by Mr. Walsh to show as Government khas. Objections were made by the jotedars; but when enquiry was made at the time of attestation, the plots to which they referred were recorded in Government khas possession, or as in possession, of the jotedar according to the circumstances of the case. Where a stream is a running one and supplies water to several jotes, it was recorded as Government khas, and where it gives water to only a single jote, it was entered as part of that jote.

53. *Khanapuri.*—There are two kinds of crop-yielding land in the Western Duars, viz., "rupit," from which the cold-weather or áman paddy is obtained, and "faringati," which yields the bhadoi, or early paddy, as well as tobacco, jute, and other rabi crops. The jotedars know these lands as "haimanti" and "bhadoi," or "dola" and "danga." The surveyors were at first instructed by the Commissioner to classify the land as 1st, 2nd, and 3rd class rupit, and 1st, 2nd, and 3rd class faringati. The survey amíns found it impossible to classify rupit and faringati into 1st, 2nd, and 3rd class, and the jotedars asked to have their land classified into high land or faringati, and low land or rupit. This classification was approved by His Honour the Lieutenant-Governor, and accordingly the classification was made in the whole of the three parganas of North Mynaguri, Chengmari, and South Mynaguri of the Mynaguri tahsil, thus—

(*a*) Basti (includes homestead, garden, and bamboos).
(*b*) Rupit.
(*c*) Faringati.
(*d*) Doba (fish-ponds).
(*e*) Waste.

All low land has been classified as rupit, and also all land on which two crops (viz., bhadoi paddy and áman paddy) are generally grown in one year, and only high lands on which tobacco and rabi crops are grown have been classified as faringati. This system of classification is understood by the jotedars and their under-tenants, and has been accepted by them.

54. *Fixation of rents.*—As regards fixation of rent of chukanidars and other under-tenants of the jotedars, the instructions at first given to the Settlement Officer were, to simply record the amount which the chukanidar is paying at present and to leave it to the jotedar, if dissatisfied, to apply for settlement of the fair rent to be paid by the chukanidar. These orders were given by Government, on a representation made by Mr. Lowis, the Commissioner, that *chukanis* were permanent tenures held under the jotedars, at fixed rents. But it having been subsequently ascertained that this was not an altogether correct statement of the facts, the Settlement Officer was instructed to settle the rents of the chukanidars of his own motion.

55. *Assessment o revenue.*—In assessing the revenue payable to Government by jotedars, the following points have been considered, namely, (1) situation of the jote, (2) its nearness to roads, markets, and tea gardens, and (3) the circumstances of the jotedar and his ability to pay the revenue. A considerable number of the jotedars of Mynaguri tahsil are, the Settlement Officer says, Nepaulese and others who reside in Kurseong, Tindaria, and other parts of Darjeeling district; pleaders, traders, and money-lenders of the Jalpaiguri, Hooghly, Kuch Bihar, and Rangpur districts, and Muhammadans of the neighbouring estate of Bykantpur. The jotedars of Mynaguri have been specially benefited by roads and markets which have opened out every part of the tahsil; their jotes are well under cultivation and yield good crops, and their condition, the Settlement Officer reports, is prosperous in every respect. The tahsil is well advanced, and is at present the best cultivated part of the Duars. The increase of revenue in the three parganas of Mynaguri tahsil by this settlement will not, the Settlement Officer says, be below Rs. 60,000, and will be due chiefly to extension of cultivation on nearly every jote in parganas North Mynaguri and Chengmari, and also in some taluks of South Mynaguri; to the recovery by the present settlement of the amount which was remitted nearly seven years ago under the reduction scheme which Colonel

Morton had recommended; and to the application of the rates which have been sanctioned for this settlement. The number of jotes actually assessed during the year is 3,507. Of these, assessment was given out for 1,192 jotes. The area contained in these 1,192 jotes is not stated. The existing rental or revenue of them has been increased from Rs. 34,416 to Rs. 70,627. In cases in which the increase of revenue has been very great, chiefly in the taluks of parganas North Mynaguri and Chengmari, the increase has been spread over five years. When Lord Ulick Browne submitted Colonel Morton's reduction scheme for consideration of Government, he observed that Colonel Morton had expressed an opinion that "the mistakes of the last settlement, or, in other words, the causes of the over-assessment were three, viz., (1) insufficient classification of land, (2) no allowance being made for injury to crops by wild animals, (3) too sudden an increase in the total rent payable for a jote." The Settlement Officer reports that he has taken care to avoid similar mistakes in the present assessment of the Government revenue. He has been asked to report how much of the increase in revenue is due to extension of cultivation and how much to his having raised to a higher class, lands which were classified under a lower class at the last settlement, and how much to the other causes mentioned. He has not yet reported on these points.

56. The work of settlement has been considerably delayed in the Mynaguri tahsil by the number of cases of mutation of names which had to be disposed of. Great difficulty was experienced in making people pay the fees for mutation of names, in cases in which they had got the survey amíns to enter their names in the new records, as owners of the jotes, without previously applying to the Deputy Commissioner of Jalpaiguri to have their names entered in his registers. They had hoped to escape paying the mutation fees, and they paid up only when threatened with resumption of the jotes. Five hundred and forty-one cases of mutation of names were disposed of. Evidence as to possession was recorded in every case, and Rs. 2,456 were realised by the Settlement Officer on account of mutation fees.

57. *Patwáris and Kánungoes.*—No patwáris or kanungoes exist in the Duars. The Government revenue is collected by tahsildars, who supply all the information that is required from time to time regarding jotes and their tenants. These officers, and the men who are employed under them, will have to keep the records of the present settlement corrected.

58. His Honour the Lieutenant-Governor visited Jalpaiguri during the year, and was satisfied that good work was being done there. I regret that I was unable within the year to inspect Mr. Sunder's work myself, but I shall go in camp in the area now under settlement immediately that this report is submitted.

59. *Cost.*—The cost of survey during the year is reported by the Deputy Superintendent of Survey to be Rs. 1,03,658. The Settlement Officer reports the cost of survey to be Rs. 1,10,784. No explanation is furnished of the discrepancy. The Settlement Officer may have himself incurred some expenditure on demarcation and revision survey, which he has added to the expenditure incurred by the Survey Department, but he has not said so.

60. The expenditure on settlement during the year was Rs. 30,459.

Backergunge Division.

Backergunge Government Estates.

61. The annual settlement reports of Backergunge were received on the 14th October and 3rd November. These reports were manifestly incorrect and had to be returned. A revised report was received from the Collector on the 2nd January 1892, and this again was revised by a further communication received on the 27th idem.

62. At the commencement of the year under report there were 48 Government estates under settlement in various parts of the district of Backergunge. Of these, 21 were being settled under the Regulations and 27 under the Tenancy Act. Only those being settled under the Tenancy Act, which are under my supervision, are dealt with in this report, and are shown in the appendices annexed. But the progress made in the settlement of the estates under the Regulations is also shown in the Collector's report No. 8T, dated the 31st December 1891, and No. 53T, dated 24th January 1892, which are annexed.

63. The Collector, who immediately supervises the Settlement Officers, gives the following account of the work done during the year:—

(*a*) *Estates under survey and settlement under the Tenancy Act.*—The 27 estates as noted on the margin are all but two (Char Badna near Barisál and Char Chandrail in Patuakhali subdivision) within the subdivision of Dakhin Shabázpur, and consist of lands which have accreted to the main land or formed as new islands since the time of the permanent settlement, and came into the possession of Government either as estates resumed under Regulation II of 1819, as island chars taken possession of on behalf of Government under Regulation XI of 1825, or as surplus accretions to permanently-settled estates brought under assessment by the diára authorities.

1. Joynagar, No. 5285 in the file of Mr. Dwija Das Dutt.
2. Lamchipata, No. 5219 ditto.
3. Lamchi Koralmara, No. 6384 in the file of Babu Pyari Mohan Bose.
4. Kristoprosad, No. 5257 ditto.
5. Bhusan Lapta Madanpura, No. 5292 in the file of Subdivisional Officer of Bhola.
6. Char Koralmara, No. 5250 in the file of Babu Pyari Mohan Bose.
7. Char Umed, No. 5256 ditto.
8. Char Bhairav, No. 5281 in the file of Babu Pyari Mohan Bose, including
9. Char Price, No. 5302 ditto.
10. Char Lakshmi, No. 5243 ditto.
11. Lalmohan, No. 5245 ditto.
12. Lord Hardinge, No. 5249 ditto.
13. Char Kali, No. 5251 ditto.
14. Char Fasson, No. 6431 ditto.
15. Char Drummond, No. 5305 ditto.
16. Char Uday Kali, No. 5262 ditto.
17. Char Padma, No. 5234 ditto.
18. Char Shambupura, No. 5225 ditto.
19. Golakpura, No. 5226 ditto.
20. Char Madhupura, No. 5215 in the file of Subdivisional Officer of Bhola.
21. Bairagya, No. 5216 ditto.
22. Goneshpura, No. 5221 ditto.
23. Char Jangla, No. 4748 ditto.
24. Char Kala Chand, No. 5280 ditto.
25. Char Badna, No. 4697.
26. Char Sitaram, No. 5196.
27. Chandrail, No. 6277.

(*b*) *Survey operations.*—The whole work done from the commencement of survey operations down to 30th September 1890 is shown below as accurately as I am able to give it. Out of the 27 estates, the survey had been made and records prepared of six estates—Joynagar, Lamchipata, Shambupura, Golakpura, Char Padma, Char Badna—covering an area of 25·72 square miles, by local agency under the supervision of Babu Giris Chandra Dutt, Deputy Collector of the regular establishment; and of three estates—Chars Jangla, Kalachand, and Sitaram—the survey had been made under the supervision of the Subdivisional Officer of Bhola and of one estate—Char Chandrail—under the Subdivisional Officer of Patuakhali. In the case of Char Jangla the survey was made for a settlement under the Regulation, but after it was completed it was found advisable to have settlement made under the Tenancy Act, and notification was published accordingly. The cost incurred by these officers as pay of amíns for survey and preparation of records is Rs. 4,213-4-9, and the total area surveyed 28·98 square miles.

(*c*) For the survey and khanapuri of the remaining 17 estates a professional party under the orders of Colonel Steel arrived on the island in December 1889, and remained there up to the following June. In that time the party made—

(A) A traverse survey extending over 157·46 square miles; but in this area is included 92·3 square miles, the area of Char Bhuta Jahajmara, and part of Char Annada Prosad, &c., which are not at present under settlement, but which it was advisable, either for convenience of the survey, or for the prevention of further disputes as to their position, to include within the area of traverse survey. Of the estates actually under settlement, the traverse survey only covered 65·1 square miles, *i.e.*, the area of the 16 estates—(1) Lamchi Koralmara, (2) Kristoprosad, No. 5257, (3) Bhusan Lapta Madanpura, (4) Char Umed, (5) Char Bhairav, (6) Char Price, (7) Char Lakhi, (8) Char Koralmara, (9) Madhupura, (10) Goneshpura, (11) Lalmohan, (12) Bairagya, (13) Char Lord Hardinge, (14) Char Kali, (15) Char Fasson, (16) Char Uday Kali; the party being unable to make traverse survey of one estate—Char Drummond, No. 5305—as it was found to be entirely under water at high tide.

(B) Cadastral survey of the 12 estates—(1) Lamchi Koralmara, (2) Kristoprosad, (3) Bhusan Lapta Madanpura, (4) Char Umed, (5) Char Bhairav, (6) Char Price, (7) Chur Lakhi, (8) Char Koralmara, (9) Madhupura, (10) Goneshpura, (11) Lalmohan, (12) Bairagya. The area of these villages by the cadastral survey is 46·79 square miles, but the Settlement Officer informs me the area by traverse survey is 57·2 square miles. The party has given no explanation of this wide difference, nor is the Settlement Officer quite certain as yet as to the reason for the discrepancy, but the difference is probably due to omission of the area of jungle land. The Settlement Officer will, however, make a strict enquiry on this point.

(C) Khanapuri of 11 of the above-named 12 villages, the exception being Char Lakhi, comprising an area of 3·75 square miles. The area which the party gives as the area over which khanapuri and record writing was completed is 41·42. This 41·42 + 3·75, the area of Char Lakhi, comes to 45·17 square miles, which is less by 1·62 square miles than the area by cadastral survey. The Settlement Officer has yet to find out wherein the difference lies.

(D.) In June 1890, the party went into recess at Barrackpore, and I am unable to state what work was done by its members from that month up to the end of September 1890. I presume they were engaged in calculating areas, filling up the remaining columns of the khasra, preparing khatian and terij with respect to villages of which the khanapuri had been done on the field, inking up the maps, and preparing tracings of the maps for the Settlement Officer.

(E.) In November 1890, the party forwarded to the Settlement Officer khasra, khatian, terij, milan khasra, area and crop statement, and tracings of maps of six estates—Lamchi

Koralmara, Kristoprosad, Bhusan Lapta Madanpura, Koralmara, Bhairav, and Price; outline maps of four estates named on the margin, of which traverse survey only was made; and field map of the estate Char Lakhi, of which the party had not done the khanapuri. Khasra, &c., for Char Umed, No. 5256, were forwarded in January 1891; of Madhupura and Lalmohan in April; and of Goneshpura and Bairagya in May 1891. The records of the last-named four estates were forwarded in a very incomplete state, the terij and khatians being left half done and full of discrepancies; the writing, too, was in great part illegible. The seven villages, namely, Lamchi Koralmara, Kristoprosad, Bhusan Lapta Madanpura, Char Bhairav, Char Price, Char Koralmara, and Char Umed, of which the papers have been received in a complete form from the professional party, cover an area of 21·21 square miles. No information has been supplied as to what the party did in each month of the period from June 1890 to May 1891.

Char Lord Hardinge. | Char Uday Kali.
„ Kali. | „ Fasson.

(F) The total cost of the work done in these estates by the survey party, as reported by Colonel Strahan in his letter referred to in paragraph 9, is Rs. 13,841. No particulars whatever have been supplied to show how this sum is arrived at, or how much should be regarded as cost of traverse survey, cadastral survey, or khanapuri, and record writing; and if, as I believe, the distribution of the total cost between the Wards' and Government estates is inequitable, the charge against the Government estates must be increased.

(G) *Settlement work.*—As regards settlement work up to the 30th September 1890, little need be said. Babu Pyari Mohan Bose was appointed Settlement Officer for both Wards' and Government estates in the island of Dakhin Shabázpur in December 1889. The Government estates noted on the margin were made over to him on different dates, and two of these, however, viz., Joynagar and Lamchipata, were transferred from his file to that of Mr. Dwija Das Dutt on the 14th July 1890. The settlement work which Babu Pyari Mohan Bose actually carried out by the end of September 1890 is shown below :—

1. Joynagar.
2. Lamchipata.
3. Lamchi Koralmara.
4. Kristoprosad.
5. Char Koralmara.
6. Char Umed.
7. Char Bhairav.
8. Char Price.
9. Char Lakhi.
10. Lalmohan.
11. Char Lord Hardinge.
12. Char Kali.
13. Char Fasson.
14. Char Drummond.
15. Char Uday Kali.
16. Char Padma.
17. Shambupura.
18. Golakpura.

Attestation and record of rights and existing rents.—Attestation and record of rights and of existing rents of Char Joynagar and Lamchipata, which were made over to Mr. Dwija Das Dutt in Jluy 1890. He (Babu Pyari Mohan Bose) also completed the settlement work of Char Badna, but the settlement was not actually sanctioned within the year under report. The greater part of the remainder of his time was usefully spent in assisting the survey party during their operations in this district (*vide* paragraph 14), and he was also employed in other work in connection with estates of which settlement was completed before 30th September 1890 and of which no notice is called for in this report.

(H) The Subdivisional Officer of Bhola had been appointed Settlement Officer for the Government estates noted on the margin, but he did not have any regular settlement work actually carried out by the end of September 1890, except that he recorded rights in Chars Kalachand and Sitaram, and recorded fair rents in the latter estate, and made first publication of draft records with respect thereto. The Subdivisional Officer of Patuakhali had on his file the case of Char Chandrail, and completed the settlement proceedings towards the close of the year, final report being submitted within the year under report.

1. Char Jangla.
2. Char Kalachand.
3. Bhusan Lapta Madanpura.
4. Madhupura.
5. Bairagya.
6. Goneshpura.
7. Char Sitaram.

(I) Mr. Dwija Das Dutt joined his appointment as Assistant Settlement Officer for the Government estates on the 12th July 1890. Government estates noted on the margin were made over to him from the file of Babu Pyari Mohan Bose, on the 14th July 1890. The settlement work which he carried out from the 14th July 1890 to 30th September is shown below :—

Joynagar and Lamchipata.

(*a*) Supervision of the correction and copying of the records of Joynagar and Lamchi pata in the revised forms introduced.
(*b*) Settlement of disputes in those two estates.
(*c*) Making local enquiries regarding rent rates in and around these two estates.

(J) *Total cost of survey and settlement.*—Assuming that the survey party completed their work within 30th September 1890, and that the figures as to cost given by Colonel Strahan are correct, the total cost of the operations on the 24 Government estates up to 30th September 1890, is shown below :—

Survey—

	Rs.	A.	P.
Cost incurred for survey by local agency	4,213	4	9
Ditto by survey party	13,841	0	0
Total ...	18,054	4	9

	Rs.	A.	P.
Settlement—			
Cost incurred by Babu Pyari Mohan Bose (being one-third of total cost of his pay, allowance, and establishment—*vide* paragraph 19) as well as price of stones embedded by the professional party on the traverse lines of Government estates ...	1,986	14	7
Cost incurred by Mr. Dwija Das Dutt, his pay and establishment	1,236	13	1
Total ...	17,064	11	8

(K) At the commencement of the year under report the work which remained to be done is shown below:—

Survey—

(*a*) Khanapuri and record writing of Char Lakhi, No. 5243, covering an area of 3·75 square miles, and revision of measurement papers and preparation of records of Char Jungla (area ·65 square miles).

(*b*) Completing the draft records of the four estates Lalmohan, Madhupura, Bairagya, and Goneshpur, of which the draft records were forwarded by the survey party in an incomplete state.'

Settlement—

1. Lamchi Koralmara.
2. Kristoprosad.
3. Bhusan Lapta Madanpura.
4. Char Umed.
5. Char Bhairav.
6. Char Price.
7. Char Lakhi.
8. Char Koralmara.
9. Char Madhupura.
10. Goneshpura.
11. Bairagya.
12. Lalmohan.
13. Char Lord Hardinge.
14. Char Kali.
15. Char Fasson.
16. Char Drummond.
17. Char Uday Kali.
18. Char Jangla.

(*a*) The entire settlement work of the estates noted on the margin.

(*b*) The settlement of disputes and fixation of fair rents for Joynagar, Lamchipata, Char Padma, Shambupura, Golakpura.

(*c*) Publication of the final records of the above-named five estates.

(*d*) Completion of settlement of Chars Kalachand and Sitaram.

(*e*) Submission of final report of Char Sitaram and sanction to settlement of Char Badna to be obtained. (NOTE.—Settlements are shown as pending in our register till formal sanction is recorded by the Collector, Commissioner, or Board, as the case may be.)

(*f*) Preparation of copies of khatians for tenants of all the estates under settlement.

(L) *Work actually done during the year under report.*—Within the year the following estates were made over to Mr. Dwija Das Dutt from the file of Babu Pyari Mohan Bose:—Lamchi Koralmara, (2) Kristoprosad, (3) Char Koralmara, (4) Char Umed, (5) Char Bhairav, (6) Char Price, (7) Char Lakhi, (8) Char Lalmohan, (9) Lord Hardinge, (10) Char Kali, (11) Char Fasson, (12) Char Drummond, 5305, (13) Char Uday Kali; and the following from the Subdivisional Officer of Bhola:—(1) Bhusan Lapta Madanpura, (2) Madhupura, (3) Goneshpura, (4) Bairagya. These with Joynagar and Lamchipata, which he had at the beginning of the year, make a total of 19 estates in the file within the year.

(M) The work done by him is shown below:—

Survey—

(*a*) Khanapuri and record writing of Char Lakhi completed, comprising an area of 3·75 square miles.

(*b*) Completion of the record writing of the four estates Lalmohan, Madhupura, Bairagya, and Goneshpura, of which the draft records were forwarded by the survey party in an incomplete state, comprising an area of 32·2 square miles.

(N) *Settlement*—

(*a*) Attestation, including record of rents and rights and fixation of fair rents completed in the four villages noted on the margin,* comprising an area of 32·2 square miles.

* 1. Lalmohan.
2. Madhupura.
3. Goneshpura.
4. Bairagya.

(*b*) Publication of draft records after attestation, record of rents and rights and fixation of fair rents made with respect to ten villages named on the margin,† comprising an area of 40·1 square miles.

† 1. Joynagar.
2. Lamchipata.
3. Lamchi Koralmara.
4. Kristoprosad.
5. Bhusan Lapta Madanpura.
6. Char Bhairav.
7. Char Price.
8. Char Umed.
9. Char Lakhi.
10. Char Koralmara.

(*c*) Raiyats settled on patit land in Char Kristoprosad, Lord Hardinge, Char Kali, comprising an area of 6·17 square miles. (This, which is a work very profitable to Government, is not a work which ordinarily comes within the province of a Settlement Officer. Mr. Dwija Das Dutt deserves much praise for his success in inducing settlers to take up these lands, which hitherto have been left in a state of jungle.)

(*d*) Final publication of record of rights made in the case of Lord Hardinge and Char Kali. The number of tenants whose rents and rights have been recorded, and for whom fair rents have been fixed, by Mr. Dutt during the year under report, is 7,684; besides these, fair rents only were fixed by him for 4,866 tenants whose rent and rights were recorded by Babu Pyari Mohan Bose in the previous year. The number of suits disposed of by Mr. Dwija Das Dutt is 972—148 civil and 824 miscellaneous.

(O) *Work done by Babu Pyari Mohan Bose—*

(*a*) The settlement of fair rents for 1,385 tenants of Chars Padma, Shambupura, and Golakpura.
(*b*) Publication of the final records of these three estates and submission of final reports.
(*c*) Preparation and distribution of copies to the tenants of these three estates.
(*d*) Disposal of objections and disputes as far as these three estates are concerned.
(*e*) Settlement of Char Padma sanctioned.

(P) *Work done by the Subdivisional Officer of Bhola—*

Chur Sitaram.—Settlement report submitted and sanctioned, rights of 38 tenants being recorded and rents settled.
Char Kalachand.—Fair rents settled.
Char Jangla.—Draft records prepared.

(Q) *Work done by the Subdivisional Officer of Patuakhali—*
Char Chandrail.—Final report submitted and settlement sanctioned.

(R) The cost of operations during the year from 1st October 1890 to 30th September 1891—

Survey—

Departmental, Rs. 381-4.* The survey work done under Mr. Dwija Das Dutt was done by his settlement establishment and is charged to settlement.

* This is amount paid in the year for work done departmentally in the preceding year.

Settlement—

	Rs.	A.	P.
Cost of settlement for the estates in Mr. Dwija Das Dutt's file	7,249	7	7
Cost of settlement for the estates in the file of Babu Pyari Mohan Bose	1,107	2	5
Cost of settlement for the estates in the file of the Subdivisional Officer of Bhola	.....		
Total ...	8,356	10	0

(S) *Work remaining to be done at the close of the year.*—With regard to Government estates under settlement, the work of survey and settlement which remained to be done at the close of the year under review was—

Survey ... ... *Nil.*

Settlement—

Babu Pyari Mohan Bose.

(*a*) Obtaining sanction of Shambupura, Golakpura, and Chur Padma.
(*b*) Final report to be submitted of Chars Lord Hardinge and Kali.

Mr. Dwija Das Dutt.

1.	Joynagar.	6.	Char Bhairab.
2.	Lamchipata.	7.	Char Price.
3.	Kristo Prosad.	8.	Char Lakhi.
4.	Lamchi Koralmara.	9.	Char Koralmara.
5.	Bhusan Lapta Madanpura.	10.	Char Umed.

(*c*) Final publication after settlement of disputes to be made in the villages named on the margin.

Mr. Dwija Das Dutt	1. Lalmohan.	3.	Bairagya.
	2. Madanpura.	4.	Goneshpura.
Subdivisional Officer, Bhola.	5.	Char Jangla.	
	6.	Char Kalachand.	

(*d*) Settlement of disputes and publication of draft records to be made in six villages named on the margin.

(*e*) Preparation of copies for tenants for the villages named in (*a*), (*c*), (*d*).
(*f*) Settling raiyats on patit land, part of Chars Umed, Bhairab, Price, and all of Char Fasson, with cadastral survey of the area settled, and preparation of record of rights in respect thereof.
(*g*) *Chars Uday Kali and Drummond.*

(T) It may here be noted that of the 24 estates shown as pending settlement at the commencement of the year under review, there is no settlement work to be done in Char Uday Kali, in which there are no tenants, and in respect to which the previous settlement, a farming settlement, will continue in force till 1302, after which raiyats may be induced to take up the land; and in Char Drummond, in which also there are no tenants and which is still under water at high tide. The names of these two estates will be removed from the list of pending cases.

Cases pending *at close of year*—		
Under (*a*)	...	3
„ (*b*)	...	2
„ (*c*)	...	10
„ (*d*)	...	6
„ (*f*)	...	1
„ (*g*)	...	2
		24
Finally disposed of during year		3
		27
Instituted during year		*Nil*
Pending at commencement of year		27

(U) *Total cost of survey and settlement from the commencement to the year under report.*—The total cost from the commencement of operations to the close of the year is on the figures as adopted in the report—

	Rs.	A.	P.
Survey	18,435	8	9
Settlement	11,580	5	8
Total ...	30,015	14	5

64. The discrepancies noticed in the Resolution on my annual report for the Financial year ending March 1891, between the number of Government estates in Backergunge and the number supplied to His Honour the Lieutenant-Governor on tour, are explained in the note annexed to the Collector's report.

65. I inspected the work of Babu Pyari Mohan Bose and Mr. Dwija Das Dutt from the 17th to the 23rd April 1891, and again since the close of the year. The work of khanapuri and attestation done by these officers appeared to me to have been done well and carefully. I examined several of their decisions, and thought them fairly convincing though somewhat discursive. The increase of revenue obtained and expected in the Government estates in Backergunge now under assessment under the Tenancy Act, is Rs. 25,114. This increase is mainly due to extension of cultivation and to the assessment at prevailing rates of lands held hitherto at abnormally low rents. There is no doubt that recognized prevailing rates do exist in these island chars in Backergunge. The chars being of recent formation, there is little difference between the rates paid by one raiyat and another on the same char, the lands of which are as a rule exactly of the same quality. Babu Pyari Mohan Bose was on tour 192 days—his headquarters is at Dowlatkhan—and Mr. Dwija Das Dutt was on tour 167 days during the year ending 30th September 1891.

Chittagong Division.

Government Estates in Tippera.

66. The Deputy Collector in charge Babu Rajani Kumar Datta has submitted a confused report in which Government and private estates are mixed up, and from which it is difficult to ascertain what was actually done during the year under report.

67. *Singergaon.*—The survey and preparation of the record of rights were completed at the close of 1889-90. There were 112 objections filed under section 105 of the Tenancy Act regarding the classification of lands and entries in the khatians and 30 objections under section 106, which were disposed of in the first half of the year. The final records were published in March 1891. An increase of Rs. 2,346 has been obtained on the previous rental of Rs. 4,830, and is due to the assessment of jungle lands previously left unassessed and to enhancement of rates owing to rise in prices since they were last fixed. The total cost was Rs. 3,259, or 15 annas an acre, on an area of 3,465 acres. This high rate is due to delay caused in the decision of numerous disputes.

68. *Pargana Maizurdi.*—The survey was completed during the last cold season, and the draft records were published on 25th June 1891. There were 41 objections under sections 105 and 106 of the Tenancy Act, which were locally enquired into and disposed of. The records were published on the 30th September 1891. An expenditure of Rs. 180 was incurred on an area of 527 acres, or nearly 5½ annas per acre, and an increase of Rs. 391 obtained on the previous rental of Rs. 874, which is due partly to enhancement of rates and partly to the assessment of excess lands.

69. There was no special officer in charge of these settlements. A Deputy Collector of the district staff, Babu Rajani Kumar Datta, was in charge.

He was 125 days on tour. During the latter half of the year Babu Shashi Bushan Datta was in charge of the settlement of *Maizurdi* and of the settlement of estates which are being settled under the Regulations, of which there are 28. These are not dealt with in this report. Babu Shashi Bushan Datta was on tour 92 days of the latter half of the year.

Government Estates in Noakhali.

70. *Char Peer Bux.*—This estate was notified for survey and settlement under the Tenancy Act in July 1890. The survey was completed during the year, and the records were finally published on the 6th April 1891. The estate comprises an area of 5,176 acres with 136 raiyats, and a rental of Rs. 3,145, or Rs. 551 in excess of the previous jama. The survey cost Rs. 478 and settlement Rs. 116.

71. *Char Gazi and Char Fakira.*—The settlement of these two estates was begun under the Regulations in December 1890. Subsequently in July 1891, Government ordered that the record of rights and settlement of rents should be made under the Tenancy Act. The estates comprise an area of 7,255 and 2,748 acres, respectively, the former being a Government estate and the latter a resumed estate, the property of private individuals. The survey was completed during the year under report and cost Rs. 1,311. The settlement work had not commenced at the close of the year. A summary settlement of the latter estate (Char Fakira) for the current year has been made with the proprietors at the previous jama.

72. The work in these three estates was carried out by a Deputy Collector of the district staff, Babu Jamini Mohan Das, who was out on tour on settlement work only 8 days during the six months ending 30th September 1891. He was also employed on other work during the year, and therefore was, it is said, unable to give proper attention to settlement duty. The measurements were tested by a Sub-Deputy Collector of the district staff. There has been much unnecessary delay in bringing these petty settlements in this district to a conclusion.

DACCA DIVISION.

Government Estate in Dacca.

73. *Jowar Joymangal.*—The survey and settlement of this estate was completed before the commencement of the year under report, but the proceedings were not finally closed, pending decision of certain disputes which were disposed of at the end of April 1891. The survey cost Rs. 221 and the settlement Rs. 161; total Rs. 382, or annas $4\frac{1}{6}$ per acre on an area of 1,199 acres. It was not necessary for the Settlement Officer, it is said, to go into camp during the year. Babu Mohendro Nath Mojumdar, Deputy Collector of the district staff, was in charge of the proceedings from 1st October 1890 to 3rd December 1890, and Babu Srinath Bhadra for the remainder of the year under report. There has been great and unnecessary delay in completing the proceedings and submitting the final report.

BURDWAN DIVISION.

Government Estates in Midnapore.

74. The only Government estate in Midnapore under settlement, under the Tenancy Act, during the year, was Bhetia. Survey and settlement proceedings were completed by the Settlement Officer by end of the year 1890, but an appeal was made against his decision by certain tenure-holders locally called aymadars. This appeal has not yet been decided by the Special Judge, and the final report has not therefore been yet submitted. No expenditure was incurred during the year. Babu Rajendra Nath Roy is the Settlememt Officer. He is also in charge of the survey and settlement of a number of private estates, of which a record of rights is being made under the Tenancy Act.

PRESIDENCY DIVISION.

Government Estates in Nadia.

75. The only Government estate in Nadia under survey and settlement under the Tenancy Act was Khosalpur. The survey of this estate, which contains an area of 425 acres, and consists of patches of land scattered throughout 13 villages, was commenced in April 1889. The measurement was

completed in May 1890. The settlement of this small estate was in charge of Babu Annoda Prosad Sen, a Deputy Collector of the district staff, who has allowed the proceedings to be unnecessarily delayed. He now reports that the settlement will be soon finished. His reports on it are confused and contradictory.

WARDS' ESTATES.

BURDWAN DIVISION.

Burdwan Raj Khas Mehals.

76. The total area of the Burdwan khas mehals, which is reported to have been surveyed to the end of September 1890, is as follows:—

		Acres.
Hukumapur		16,230
Sujamutha		28,889
Bankura		*151,082
Burdwan		37,817
Hooghly		7,586
Nadia		39
Total ...		241,643

77. The total cost of survey to the end of September 1890 is reported by the Settlement Officer to be Rs. 1,03,425. At a conference held in Burdwan on the 29th June 1891, it was proposed to make a traverse survey of tauzis Nos. 1, 2 and 3 of the Bankura district, but it was decided before doing so, that a special report be submitted by the Manager showing what results had been obtained from the traverse survey of tauzi No. 4 of that district, and whether the Raj had been put in a position to recover possession of lands of which it had been dispossessed in tauzi No. 4, of which a traverse survey had already been made. To enable the Manager to come to a conclusion on this point, Mr. Shaw with a small detachment was engaged during the year under report in (*a*) relaying thakbust boundaries of 21 mauzas which had been leased in patni in tauzi No. 4, so that a comparison might be made of the areas now in actual possession of the patnidars with the lands they should be in possession of, according to the thakbust maps; (*b*) and also in the cadastral survey of some lands in the Burdwan and Birbhum districts, which are admittedly khas, but were omitted from survey in the previous seasons (*c*) in distinguishing by comparison between the thakbust and present survey maps, the lands that appertain to the several lots which make up the Sujamutha estate. The boundaries of 21 mauzas above referred to were relayed during the year. An area of 2,769 acres was cadastrally surveyed in Burdwan and Birbhum. The boundaries of villages which had already been surveyed in Sujamutha were rectified. The lands appertaining to the 13 different tauzis of which the Sujamutha property is composed were distinguished. The work that remained to be done at the end of the year is as follows:—

(*i*) Cadastral survey of about 40,000 acres which, though most of it was notified for survey and is admittedly a part of the khas mehals, yet was never pointed out to the survey officers by the managing authorities as part of their estates, and therefore was omitted by the survey party from survey altogether.

(*ii*) The traverse survey of tauzis Nos. 1, 2 and 3 of Bankura with an area of about 650 square miles. Mr. Shaw is now engaged onthis work.

78. The total expenditure on survey during the year was Rs. 18,982.

79. *Sujamutha.*—The survey of Sujamutha was completed before the beginning of the year under review. The settlement was at first entrusted to Mr. Reily, who it was hoped would be able to make an amicable settlement of rent with the raiyats. After Mr. Reily had made numerous attempts to affect an amicable adjustment of rents without success, the Settlement Officer, Mr. Dwijendra Lall Roy, was instructed to settle fair rents in accordance with the law. That officer reduced the existing rent in village Madhukali on the ground of deterioration of the soil, due to the obstruction of the drainage. The Special Judge reversed the Settlement Officer's decision on appeal. Some time after this I visited Sujamutha and in accordance with the orders of His Honour the Lieutenant-Governor, suggested terms of a compromise which, with some modifications,

* Of this 65,000 acres is chiefly jungle and 10,000 ghatwali.

were approved by the Board and accepted by the Manager and the raiyats. This compromise has now been worked out. Delay has been caused in giving effect to it by the distribution of holdings of the 13 separate estates of which the property is composed, among the different lots to which they belong. These separate estates were surveyed and treated as one estate. According to the Settlement Officer's report, which is curt and misleading, the rents of 3,534 tenants have been settled before, and 8.618 tenants during the year under report. He gives the rent according to settlement at Rs. 80,917, the previous rental being Rs. 86,105, but in fact the new rental will equal or exceed the old. Mr. Dwijendra Lall Roy was in camp for 65 days, exclusive of halts within 5 miles of Kajlagar, his head-quarters. The number of days spent on tour, considering the orders repeatedly given to him to go into every village and dispose of objections on the spot, was, I consider, utterly inadequate. The delay and extra expense attendant on the settlement proceedings in Sujamutha is greatly due to the want of co-operation on the part of the Raj officials, and to their failure to furnish the Settlement Officer with information which was in their possession.

The expenditure incurred on settlement was Rs. 14,810, of which Rs. 8,960 was expended during the year.

80. *Hukumapur.*—This estate, together with two other mehals, Panchberia and Chandnihat, in Birbhum, belonging to the Burdwan Raj were, under settlement during the year under report. They contain 90 villages with an aggregate area of 16,229·62 acres, of which area 15,586·69 acres belonging to Hukumapur and 415·60 acres in two villages belonging to Panchberia and Chandnihat, were surveyed before the end of September 1890. The remaining 109 acres of Hukumapur and 118·33 acres of Panchberia were surveyed during the half-year ending September 1891, and the records of all the 90 villages were made over by the professional survey party, to the Settlement Officer, by the end of September 1890. The records of Hukumapur were finally published on the 30th June 1891, and all the khatians fair copied. The settlement of the other two villages was amicably made, by the Settlement Officer, on the spot, under instructions, which were approved by the Board, and occupied only four days. There are 2,211 raiyats in Hukumapur, 193 in Panchberia, and 16 in Chandnihat—total 2,420, with a rental of Rs. 15,009-13-8, against the previous jama of Rs. 12,818-13-8, thus yielding an increase of Rs. 2,191. The survey cost Rs. 10,500, and settlement Rs. 17,574; fair rents had been settled for 129 tenants up to September 1890, and for the remaining 2,092 during the year. The difficulties that arose in the settlement of rents and the terms of compromise finally accepted, by the parties are described in the Settlement Officer's report, which is annexed.

81. The Settlement Officer, Babu Sukumar Haldar, was in camp 84 days. I consider the number of days spent by this officer in camp very inadequate. I inspected his office, and the work of khanapuri, attestation, and settlement of rents on the ground in March 1891, and suggested certain terms of compromise between the managing authorities and the raiyats which were ultimately accepted, and according to which the settlement has since been concluded.

Bhagalpur Division.

Raj Srinagar-Banaili Estates.

82. Mr. Collin was in charge of the Settlement office from 1st October 1890 to 8th May 1891, but in addition to his duties as Settlement Officer he also held charge of the office of Collector of Purnea from 1st October to 7th November 1890. Babu Bepin Behari Dé, Assistant Settlement Officer, was in charge of settlement work in the Malda district from 1st October 1890 to 20th January 1891, when he was relieved by Babu Barhamdeo Narain. The latter officer was in sole charge from the 9th May 1891 to the end of the year. The head-quarters of Mr. Collin was, during the year under report, at Purnea. Babu Bepin Behari Dé's head-quarters was at Malda. Babu Barhamdeo Narain had no head quarters until he relieved Babu Bepin Behari Dé at Malda. Mr. Collin was absent from his head-quarters 33 days within the period from the 1st of October 1890 to the 7th May 1891, Babu Bepin Behari Dé 33 days between the 1st October 1890 and the 20th January 1891, and Babu Barhamdeo Narain was on tour 179 days out of the entire year. The greater part of

the settlement of these estates had been completed before beginning of the year under review What remained to be done during the year was the final publication of the records, retrial of cases which had been remanded by the Appellate Court, compilation of statistical statements, and writing the final report. Besides this there remained in the district of Malda the measurement of five villages in pargana Kotwali, of one village of pargana Akbarabad, and the settlement of 44 villages of parganas Kotwali and Akbarabad. The five villages in parganas Kotwali and Akbarabad were at first omitted from survey at the request of the managing authorities, as they were of a scattered character, and it was thought they were not worth the expense of a survey. Later on the landlords applied for a measurement, which was accordingly carried out. The village omitted in pargana Akbarabad is one which had diluviated in the year of survey and was subsequently re-formed. As regards the 44 villages which remained for settlement in parganas Kotwali and Akbarabad, a dispute arose as to the standard of measurement, the proprietors claiming five cubits to the luggee, and the raiyats six cubits of 22 inches. The dispute was judicially decided in May 1890 in favour of the landlord; the raiyats appealed against this decision, and pending disposal of the appeal, both parties applied to have the settlement of these villages deferred. The appeal was decided by the Special Judge in favour of the landlord, but yet the raiyats refused to attend and attest the areas of their holdings and the amounts of their rents, though summonses were issued against them individually. Mr. Collin was chiefly engaged during the part of the year in which he held charge of the Settlement office, in publication of the final records, in the preparation of statistical statements, and in compilation of the final report. He also visited Malda twice and completed the settlement of eleven villages with 1,509 tenants. From November 1890 to the middle of January 1891, Babu Barhamdeo Narain was in camp in the Farkiah pargana of the Monghyr district. He settled two villages containing 316 tenants, and decided 16 boundary disputes which have been remanded for fresh trial by the Commissioner and the Board. From that time to end of the year he was principally engaged in recording rights and settling rents in pargana Akbarabad in the Malda district. Babu Bepin Behari De was engaged from the 1st October 1890 to the 20th January 1891 in the Malda district. He decided four boundary dispute cases, disposed of 170 objections under section 105, of 12 disputes under section 106, and settled the rent of 66 raiyats. The progress made in the settlement of 44 villages in pargana Kotwali and Akbarabad is described by the Assistant Settlement Officer thus:—

(*a*) In the Malda district the settlement of 15 villages of pargana Kotwali and 29 villages of pargana Akbarabad was made during the last administrative year. I will take up each pargana separately.

Settlement of pargana Kotwali.

(*b*) In pargana Kotwali the settlement of two villages, Harinarainpur and Chuck Harinarainpur, was made by Babu Bepin Behari Dé. There was no dispute regarding rates, and both parties agreed that excess area should be assessed without any allowance. The settlement was made on these terms. Babu Bepin Behari Dé also settled the rent of 13 raiyats of mauza Sadpur. These men claimed to be fixed rent raiyats, and objected to pay additional rent for the excess area; but additional rent was decreed after an allowance of two cottahs in the bigha, and four tenants were held to be fixed rate raiyats. There was no appeal made. The settlement of two other villages, viz., Lakhighat and Jalalpur, was made by Mr. E. W. Collin. In the former, application for settlement of fair rent was made regarding nine raiyats only in whose case there was an increase of area, and it was assessed at the rate of 8½ annas per bigha without allowance with the consent of the raiyats. In Jalalpur only the existing rent was recorded without dispute, and fair rent was fixed regarding four raiyats only. He (Mr. Collin) also settled the rent of seven tenants in Sultanpur, of which the attestation had been made by me. There was no application for settlement of rent of other tenants. The settlement of two villages, Pirojpur and Boojroog Sultanpur, was made by me. There was no dispute regarding the rates, and the excess area was assessed after an allowance of two cottahs in the bigha. This was the rate of allowance made in other villages of this district in the previous year. In three other villages of this pargana, namely, Jote-Beeroo, Jote-Binode, and Rajibpur, the existing rent only was recorded in the absence of application for settlement of fair rent. In the remaining four villages of this pargana the existing rent only of all the raiyats was ascertained and recorded. The landlords did not generally apply for settlement of fair rent in this pargana, 1*stly*, because there was little increase of area; and, 2*ndly*, in order to avoid disputes regarding existing rent and rates.

Settlement of pargana Akbarabad.

(*c*) There are five talukas in pargana Akbarabad. The first, Lukhipur, includes two villages, Lukhipur and Bishnu Pursad; the second, Gopinathpur, includes seven villages; the third, Mustafapur, includes fifteen villages; the fourth, Srinibashpur, includes three villages; and the fifth, Hudeenugar, includes two villages, Hudeenugar and Mahammadpur. The settlement of the first two talukas was made by Mr. Collin. He recorded only the existing rent of the raiyats who held lands only in Bishnu Pursad. Application for settlement of fair rent under section 104 (2) had been withdrawn, as there was no previous measurement of this village. In Lukhipur, owing to division and transfer of holdings, of which no notice was given to the zamindar, the rent recorded in the jamabandi papers was very disproportionate to area found by present survey, and the areas entered in the *hustabud* papers differed materially from that found by the survey. The rent of the tenants who held land in Lukhipur, and also of those who held land in Lukhipur as well as in Bishnu Pursad, was consequently fixed at the village rate of eight annas per bigha on the survey area with the consent of the majority of the raiyats. The settlement of taluka Gopinathpur was also made by Mr. Collin. The raiyats of this taluka did not attend the settlement proceedings, and their existing rent was recorded by the Settlement Officer mostly according to the *hustabud* of the zamindar. The same was also held to be the fair rent. After publication of the draft record of this taluka, the landlords presented a number of petitions, saying that several *jamas* entered in the *hustabud* did not find place in the settlement records. In course of enquiry in these cases it came to light that many raiyats of this taluka held very much more or less land than what was entered in the *hustabud*, and the rent payable was unreasonably disproportionate to the area held by them. The settlement of taluka Mustaffapur had to be made by me. The raiyats of this taluka were as recusant as those of Gopeenathpur, and there was the same disparity between the area found and the rent entered in the *hustabud*. I accordingly followed the procedure adopted regarding Lukhipur, and fixed the rental of each holding according to the area found by the survey at the village rate of 10 annas 9 pies including *battah*, which was admitted by both parties. The raiyats of taluka Srinibashpur attended the settlement proceeding, and their existing rent was correctly recorded. The same was held to be fair rent, as there was no proof of previous measurement and previous area. The majority of the raiyats of this taluka had been held to be fixed rent raiyats. The existing rent was only recorded in the village Mahammadpur, as there was no application for settlement of fair rent by either party; and although a portion of the village was diluviated, the raiyats, in order to preserve their rights, did not desire a reduction of rent. The whole of Hudeenugar had submerged in the Ganges, and emerged after two years, when one Babu Bhagabutti Charan Roy, the owner of an indigo factory, who had several villages on the border of Hudeenugar, forcibly sowed indigo in the newly-formed land. This dispute was to be tried between him and the Banaili Raj under the Survey Act, but it was compromised by Bhagabutti Charan acknowledging the proprietary right of the Banaili Raj, and the latter agreeing to give him a lease of the village at the rate of 8 annas per bigha. The old raiyats of Hudeenugar contended that their right in the land had not been extinguished, while the landlords urged that they had lost the right by non-payment of rent. This case also was compromised by lands being settled with the raiyats at 11 annas per bigha.

Abstract of the former and present rental in pargana Akbarabad.

(*d*) The subjoined table will show the past and present rental of five talukas in pargana Akbarabad:—

Name of the taluka.	Present rental by settlement.	Former rental.
	Rs.	Rs.
Lukhipur	2,074	1,941
Gopinathpur	2,468	2,390
Mustaffapur	4,189	3,812
Srinibashpur	377	1,005
Hudeenugar	1,112	

The increase in Gopinathpur is due to the assessment of new holdings. The rent-roll of Srinibashpur and Hudeenugar was kept together by the landlords.

83. *Maintenance of the records.*—In order to train the patwáris of these estates in the work of survey, classes were opened at the tahsil office of the Daphar pargana and at Nohatta in Bhágalpur, at Monghyr, and at Purnea. Out of 151 patwáris of the Srinagar estate, 48 received certificates of proficiency, and the majority of the others were partially trained. The Superintendent of the survey party reported that, though only a small proportion of the patwáris of the estate received training sufficient to permit of their being provided with certificates, yet most of them took an intelligent interest in the work while in progress, and the greater number are, in his opinion, quite capable of making corrections and additions to the maps, although unable to make complete original surveys of whole villages. Since the settlement has been in progress, the number of patwáris on the Court of Wards' portion of the estate has been

reduced by 47. There are now 104 patwáris, of whom 48 have received certificates and the rest have been partially trained. This makes a provision of one patwári to every 6½ square miles, in which the estate owns a half share. In addition to the patwáris, the Manager has appointed a staff of 15 officers, who have been selected from employés of the Survey Department, and whose duty it is to supervise the patwáris and to check the records and maps. Each of the proprietors has been supplied with copies of the village maps, and with complete copies of the records, viz., khasra, khatians, and terijes. A set of rules has been drawn up by me, and issued by the Board of Revenue for the maintenance of the records, and there should be no difficulty in carrying out the work of correcting them from time to time, if the rules are observed. The Srinágar-Banailí estates having now passed out of the hands of the Court of Wards, it will be for the proprietors to keep up the records or not as they may wish.

84. *Cost.*—The total expenditure shown in Appendix A as having been incurred to end of September 1891, is taken from the report of the Assistant Settlement Officer, Babu Barhamdeo Narain, who is now in charge of the Settlement office. The total area surveyed was 698⅔ square miles, or 447,189 acres. The total cost of survey and settlement from the beginning of the operations to the end of year was Rs. 3,01,384, and the total increase of rent Rs. 22,770.

I inspected the work twice during the year, once at Purnea and once at Malda.

Dacca Division.

Dakhin Shabázpur Pargana in Backergunge.

85. The circumstances under which this estate was brought under survey were described in previous reports. The Dakhin Shabázpur pargana is divided into two mahals or estates, Nos. 1763 and 1764 of the Backergunge Collector's tauzi. Estate No. 1763 is entirely managed by the Court of Wards, and estate No. 1764 is held jointly by the Court of Wards and others. The co-sharers of No. 1764, who at first refused to join the Court of Wards in an application for survey and record of rights, submitted during the year an application for the preparation of a record of rights of their shares also. This application has been granted. The work done during the year is described by the Collector as follows:—

(*a*) *Survey.*—The operations for the survey and record of rights of this estate, No. 1763, commenced in December 1889, and from the commencement down to 30th September 1890 the work which had been done is shown below:—

A professional survey party under the orders of Colonel Steel arrived on the estate in December 1889 and remained there up to the following June. They were engaged on the survey of the Dakhin Shabázpur ward's estate and nine Government estates in Backergunge at the same time. The work done in the Dakhin Shabázpur estate was the following:—

(A) Traverse survey of the whole estate, the area of which was found to be 130·65 square miles comprised in 38 villages.

(B) Cadastral survey of 36 of these villages, comprising an area of 124·56 square miles.

(C) Khanapuri (*i.e.*, filling up the first four columns of the khasra) with respect to 14 of the smallest villages in the estate, comprising an area of only 17·58 square miles.

(*b*) In June 1890 the party went into recess at Barrackpore. They were engaged in calculating areas, filling up remaining columns of the khasra, preparing khatians and terijes with respect to the 14 villages of which the khanapuri had been done on the field, inking up the maps, and preparing tracings of the maps for the Settlement office.

(*c*) The survey party forwarded to the Settlement Officer, in October 1890, khasra, khatian, terij, milan khasra, area and crop statements, and tracings of maps with respect to four villages, and similar papers with respect to one village in November, five in January, and four in May. The records of these last four and of one of the five of which records were sent in January were found to be incomplete, as the names of intermediate tenure-holders had been omitted and some of the papers were missing, so that a revision of the whole of khanapuri work connected with these five villages became necessary. The nine villages of which the papers were received in a complete form from the professional party cover an area of 5·38 square miles only.

(*d*) The total cost of the work done in this estate by the survey party, as reported by Colonel Straban in his letter No. $\frac{738}{R\ 50-75}$, dated 6th November 1891, is Rs. 36,045-7. No particulars whatever have been supplied to show how this sum was arrived at, or how much

should be regarded as cost of traverse survey, cadastral survey, khanapuri, or record writing. This has formed the subject of correspondence the result of which will probably be that the amount charged by the Survey Department to the Dakhin Shábazpur estate will have to be reduced. The Collector estimates that the amount properly debitable to these estates is Rs. 25,278.

But this total is Rs. 2,539-1-5 less than the total given by Colonel Strahan (Rs. 49,886-7) for the work on both the Government estates and this estate.

86. *Settlement.*—The Settlement Officer, Babu Pyari Mohan Bose, joined his appointment on the 21st December 1889. From that time till September 1890 he was engaged partly in the settlement of Government estates, partly in settling disputes, in smoothing the way for the survey party in Dakhin Shabázpur, in reconciling differences which arose between the survey amíns and the tenants, and supervising and testing the khanapuri work of those amíns. The work that remained to be done on the 1st of October 1890, the work done during the year under report, and the work that remained to be done at the end of the year, is described by the Collector thus:—

(*a*) On the 1st October 1890 the work which remained to be done was—

(A) Cadastral survey of ·24 square miles. (*Note.*—There was an area of 5·85 square miles "char" land of which cadastral survey was not needed; hence difference between area by traverse and area by cadastral survey.)

(B) Khanapuri and record writing inclusive of inking in and completing the maps, estimating area, and preparation of tracings of 24 villages covering area of 107·22 square miles.

(C) The settlement work of the whole estate.

(D) The preparation of copies of records for the tenants and the Collector.

(*b*) Within the year, 1st October 1890 to 30th September 1891, the work actually done by the Settlement Officer was—

(A) Cadastral survey of ·24 square miles.

(B) Khanapuri, inking in and completion of maps, estimating of area completed for the 24 villages noted above, record writing completed for 13 villages out of the 24 (area of the 13 being 33·08 square miles).

For the other villages khatians and terijes were partly written, but the Settlement Officer cannot give the exact amount remaining to be done on 1st October 1891. Tracings prepared of maps of 23 villages out of the 24.

(C) The settlement work done in the year was as follows:—

(*a*) Attestation and record of rents completed in 11 villages covering an area of 14·49 square miles.

(*b*) First publication of records made with respect to six villages covering area of 2·09 square miles.

(*c*) Final publication made with respect to three villages covering area of ·30 square miles.

(*d*) Number of tenants whose rights have been recorded and status determined is 8,067; this is the number of tenants in the 11 villages (*a*).

(*e*) One hundred and twenty-one suits (99 for settlement of fair rents with respect to 590 tenants, and 22 suits on other questions) disposed of. Forty-two boundary disputes and 114 miscellaneous petitions of objection were also disposed of. Besides, the Settlement Officer also claims that he disposed summarily of a large number of verbal objections of which the only record is the corrections made in the records when such were found to be needed.

(D) Collectors' copies of records of the three villages (C) were prepared.

87. The small outturn of settlement work is explained as follows:—

(*a*) Records of 14 villages were received from the survey party. Of these 14 villages one had been washed away completely by the river after the survey, and no settlement work was called for with respect to it. The records of five villages covering area of 12·20 square miles were received in such an incomplete state that it was found necessary to depute amíns to revise them. The remaining eight villages of which the records were received from the survey party are included in (C*a*). The six in (C*b*) and three in (C*c*) form part of these eight. The remaining three in (C*a*) are three villages of which the khanapuri and record writing were done during the year under review under supervision of the Settlement Officer. The records of other villages of which the khanapuri was made by him could not be got ready for attestation during the year.

(*b*) The work which remained to be done at the close of the year under review was—

Survey—

Completion of record writing of 11 villages.
Preparation of tracing of one village map.
Revision of records of five villages mentioned in paragraph 18.

Settlement—

Attestation and record of rights in 26 villages (one being diluviated, the total number of villages is now 37 only).
First publication to be made in 31 villages.
Final publication in 34 villages.
Rights of 74,000 tenants to be recorded and status determined.

88. *Cost.*—The total expenditure during the year was, for survey (khanapuri) Rs. 8,141 and settlement Rs. 6,410. The total cost of the work from the commencement of the operations to the close of the year was for—

		Rs.
Survey		44,187
Settlement		9,638
Total ...		53,825

Note.—5·85 square miles of char land was omitted from cadastral survey, such survey not being needed.

89. The expenditure incurred by the Survey Department is far in excess of the estimates. The existing rents of the raiyats are accepted as fair, but it does not follow that the rental payable to the proprietors of the estate by howladars and other tenure-holders, the amount of whose rent will be settled on the basis of the rentals payable by the under-raiyats to them, will not be increased.

90. I visited Dakhin Shabázpur once during the year, and again since the close of the year, and inspected the work of khanapuri and attestation. The khanapuri, which is very complicated in Backergunge, and the work of attestation appeared to me to have been carefully done. The standard of attestation which the Assistant Settlement Officer has endeavoured to work up to is 1,500 plots a day.

Chittagong Division.

Serail Pargana Ward's Estate in Tippera.

91. The survey of this estate was undertaken by a detachment of No. 2 Party, Survey of India, in November 1889. The total area under survey, was 180,664 acres, contained in 299 villages. To the end of September 1890 the survey party had finished the traverse survey, as also the kistwar survey, of 165,882 acres, and the record-writing of 125,696 acres; the remainder was completed during the year under report, but it was not till September 1890 that the Survey Department sent in their first batch of records for 26 villages only. The settlement operations commenced in November 1890. The records of 280 villages with an area of 128,722 acres were made over to the Settlement Officer up to the end of the year under report. Of these 31, with an area of 3,378 acres, were received in the previous year. During the year, fair rents were settled and the rights were recorded of 15,773 tenants holding an area of 37,089 acres; to this must be added an area of 9,913 acres, which was either khas patit or belonged to landlords other than the Court of Wards, so that the total area of the villages settled was 47,002 acres. Of the tenants recorded as under the Court of Wards, 714, with an area of 6,642 acres, were cultivating tenure-holders, and 15,059, with an area of 30,447 acres, settled raiyats. There were also 1,221 under-raiyats, with 739 acres. An increase of Rs. 16,876 was obtained in the rental, partly by the assessment of excess lands found in the possession of tenants, and partly by assessment at prevailing rates, of lands held at less than those rates; but this amount is liable to alteration after publication of the draft jamabandi and the disposal of objections.

92. The total cost of survey to end of the year was Rs. 99,158, or annas $8\frac{3}{4}$ an acre, for an area of 180,664 acres, out of which Rs. 27,876 were expended during the year. The settlement cost Rs. 13,533, or 4 annas 7 pies an acre, on an area of 47,002 acres. The settlement work is reported to have proceeded without any difficulties. Deputy Collector Babu Kali Shankar Sen has throughout been in charge of the proceedings and was on tour 125 days.

93. I inspected the work once during the year, in April last. It seemed to me that the work of attestation and settlement was being well done, but the number of days spent by the Settlement Officer on tour is quite insufficient.

Orissa Division.

Kujang.

94. The survey of this estate, which appertains to the Burdwan Raj and contains an area of 146,804 acres, was completed previous to the year under report. During the year under review the rent of 28,841 tenants and 3,000 under-raiyats had been recorded, leaving a balance of 7,014 to be dealt with at the end of the year. Of ten boundary disputes instituted, nine were decided. Besides these, 2,738 objections relating to mutation of names, classification of soil and rent-free tenures and holdings were disposed of. The Settlement Officer, Babu Chandra Nath Ghosh, was on tour 181 days. The settlement has, it is reported, been completed, and the final report is promised shortly. The settlement was made amicably, the rents being adjusted by calculating the village rates on the land ascertained by measurement, by the 20 *dusti podika*. During the half-year ending September 1891, the Settlement Officer was principally occupied in settling rent-free tenures and in recording the rent of the under-raiyats, most of whom, it is said, cultivate lands of the lákhirajdars on the half-produce system. An increase of Rs. 7,192 has been obtained on the previous rental of Rs. 1,08,056. The cost of survey to end of the year under report was Rs. 50,648 and of settlement Rs. 21,272, out of which Rs. 13 and Rs. 5,496, respectively, were expended during the year, the details of which will be found in Appendix A. Where the application of the village rates to the area by the 20 *dusti podika* resulted in a reduction of rents, the Settlement Officer was instructed, in accordance with the recent orders of the Board and of Government, to adhere to the existing rent, and therefore had to revise the rentals of some individual raiyats, whose rentals would be reduced by strict application of village rates to survey areas. I have recently inspected the work at Massagai. The khanapuri and attestation appeared to me to have been carefully done. A separate report has been submitted to the Board, on the question of the assessment of rent and resumption of *towfir* rent-free lands.

Kanika.

95. During the year Mr. Srinath Dutt was in charge of the settlement of the Kanika estate from 1st October 1890 to 14th May 1891, when he was transferred to Burdwan. Mr. Sakhawat Hossein was placed in charge on 3rd July 1891. Mr. Srinath Dutt was 73 days on tour, and Mr. Sakhawat Hossein 85 days. The estimated area of the estate is 282,240 acres, including 104,320 acres of jungle, which latter was surveyed on the 4″ scale.

96. Up to 30th September 1890 an area of 163,630 acres was cadastrally surveyed, the balance 14,290 acres having been surveyed during the year under report. Of the 632 villages comprised in the estate, the records of 440 were made over to the Settlement Officer up to September 1890, and 137 during the year under report. Mr. Srinath Dutt recorded the existing rents and the status of 7,848 tenants. He submitted rate reports for 129 villages, which, however, the Board were not prepared to accept, because it was thought that the enhancement of rent which would result from the proposed rates was too large. Mr. Sakhawat Hossein was directed to submit a revised rate report, which he has done since the close of the year for 511 villages, but the Board, as now constituted, has been unable to accept Mr. Sakhawat Hossein's proposed rates because the proposed settlement would appear to be too lenient to the raiyats. Mr. Sakhawat Hossein was principally engaged during the portion of the year when he was in charge, in preparing his rate report. His proposals, if accepted, would result in an increase of Rs. 10,704 on a present rental of Rs. 89,344. The Settlement Officer will now, in accordance with the Board's order, have again to justify his proposed rates, and possibly to revise the rentals of some of the raiyats.

97. I visited Kanika once during the year, and examined the work of attestation done by Mr. Srinath Dutt. I found that the areas of holdings resulting from survey, and the new rentals entered against their names

which were supposed to have been explained by Mr. Srinath Dutt, had not been understood by some of the raiyats whom I examined, and I instructed Mr. Sakhawat Hossein in such cases to have the attestation done over again. He checked and completed the attestation of 31 villages containing 15,087 khasra entries, disposed of 1,103 objections and of some important boundary disputes during the year. The settlement is an amicable one. It is not conducted under any law. The Court of Wards as landlord demands whatever rent it thinks equitable. If the raiyats accept the proposed rents, the settlement is concluded; if the raiyats decline to pay enhanced rents, the enhancements must be sued for in the Rent Courts. The total cost of survey to end of the year was Rs. 66,399, and of settlement Rs. 8,965-12-2.

PRIVATE ESTATES.

BURDWAN DIVISION.

Private Estates in Midnapore.

98. During the year under report there were 11 settlements under Chapter X of the Tenancy Act on the file of the Settlement Officer, Babu Rajendra Nath Roy, whose head-quarters were at Midnapore. They were—

(1) Kesiari,
(2) Gur Moyna,
(3) Dakhin Moyna,
(4) Sudampore,
(5) Gur Safat,
(6) Changrachak or Chowrachak No. 363,
(7) Nemuck Mehal,
(8) Belabaria,
(9) Srikanta Kalaganda,
(10) Benagalsia,
(11) Maguri,

the details of which will be found in appendices A and B of this report. Two estates, Chowrachak No. 365 and Uttampore, were struck off on the application of the proprietors.

(1) *Kesiari.*—This is a long pending settlement. Orders were issued for revision of the settlement records prepared by the late Settlement Officer, Babu Bissessur Banerjee, on the ground of irregularities in his proceedings, which, however, were upheld by the Special Judge on appeal in the case of four out of the 41 villages comprised in the estate. The parties in the remaining villages have come to an amicable settlement. The final report is pending compilation of the statistics which are now being collected.

(2) *Gur Moyna*, (3) *Dakhin Moyna*, (4) *Sudampore*, (5) *Gur Safat.*—The final reports of these estates were submitted during the year under report. There were appeals to the Special Judge against the decisions of the Settlement Officer in respect of estates Dakhin Moyna and Gur Safat; the orders passed on these appeals by the Special Judge have been carried out, whilst the appeals in the cases of estate Sudampore were partly dismissed and partly withdrawn.

(6) *Changrachak or Chowrachak No.* 363, (7) *Nemuck Mehal*, (9) *Srikanta Kalaganda*, (10) *Benagalsia.*—The measurements of these estates were finished in May last and were tested by the Settlement Officer. In August following cases for determining the length of the local measuring poles and the dimensions of the local bighas were locally decided, and the work of recording rights and rents was taken up in September and is now in progress.

(8) *Belabaria.*—The work was commenced here in December 1890 and was completed during the year under report. An appeal is now pending before the Special Judge regarding a boundary dispute, the hearing of which is fixed for the 4th November 1891.

(11) *Maguri.*—The completion of the proceedings in this estate is pending result of an appeal to the Special Judge in respect of three out of the five villages comprised in the estate, in connection with the length of the local measuring poles, and the dimensions of the local bighas.

99. During the year the Settlement Officer was in camp 106 days, which, considering that he has allowed the settlement of these estates to be unnecessarily prolonged, is altogether insufficient. He was, however, also employed on road cess, and other work during part of the year.

Mollarpore Estate in Birbhum.

100. This is a permanently-settled estate, owned by Mohant Gopal Dass as patnidar under the Maharajah of Burdwan, and is situated in the district of

Birbhum. The survey and record of rights were authorized under Government notification dated 5th November 1889, because of disputes likely to end in a breach of the peace. The estate contains an area of 23,530 acres comprised in forty-five villages. The survey by plane-table commenced in January 1890 under the supervision of Munshi Nundji, who also had charge of the completion of the settlement of the Dubalhati estates, and of the measurement of some villages belonging to the Hardia Indigo Factory in Champaran. Up to 30th September 1890 an area of 21,711 acres was surveyed, and the remainder 1,819 acres was surveyed during the year under report. The survey and khanapuri having been finished in October 1890, the work of computation of field areas, checking areas by summation of fields, by comparison with statement of village areas, and attestation was done during the year under report. Five boundary disputes were disposed of before, and 26 during, the year.

101. *Fixation and settlement of rents.*—I inspected, in February 1891, the work of khanapuri and attestation, which appeared to me to have been carefully done, and having enquired into the questions in dispute between the mohant and his tenants, suggested certain terms of compromise, which the Settlement Officer reports the Collector disapproved of, on the ground that they were likely to lead to enhancements, which he thought the mohant was not entitled to. As the landlord and tenants themselves hesitated and asked for numerous adjournments, thereby prolonging the proceedings and increasing the expense, the Settlement Officer was finally instructed to proceed to settle fair rents judicially in accordance with the law. He settled the rents of 131 raiyats during the year, with the result that the existing rental of these raiyats, Rs. 1,726, was increased to Rs. 2,003. The Settlement Officer expected that settlement of rents of the remaining 3,866 raiyats would have been completed by the end of January 1892, but has not yet submitted the final report.

102. The total expenditure up to September 1890 was for—

	Rs.
Survey	6,467
Settlement	...

During the year under report—

Survey	658
Settlement	5,864
Total ...	12,989

103. The Settlement Officer's head-quarters was at Mollarpore. He was on tour 146 days during the year under report in the Mollarpore estate, 43 days in Dubalhati, and 7 in Champaran.

Rajshahi Division.

Dubalhati Estates in Rajshahi.

104. The final report of the survey and settlement of these estates was submitted to the Board with this office No. 200TA, dated the 2nd February 1892.

105. A survey and the preparation of a record of rights was sanctioned under section 101, sub-section 2(*a*), owing to the existence of serious disputes between the Rajah of Dubalhati and his tenants regarding the rent and area of holdings. The necessary notification was published in the *Calcutta Gazette* of the 20th December 1887, but 17 villages were subsequently added to the list under separate notifications, dated, respectively, the 25th July, 25th September, and 16th October 1889.

106. The survey by plane-table was commenced in March 1888 and ended in March 1890. The settlement was begun in November 1889 and was finished in August 1891.

107. The survey operations extended over a tract containing a total area of 41,794 acres, of which 4,136 were subsequently excluded from the survey. The area that came under settlement was 37,758 acres, classified thus :—

Cultivated soil.

	Acres.
Rice land	23,403
Up land	5,341
Total cultivated	38,744
New fallow	563
Old „	1,919
Other kinds	1,777
Unculturable	4,755
Total ...	9,014
GRAND TOTAL ...	27,758

Class of cultivator.

	Acres.
1. In possession of the proprietors ...	6,311
2. Tenure-holders	492

Raiyats holding under proprietors.

3. Raiyats at fixed rates	...
4. Settled raiyats	24,142
5. Occupancy	...
6. Non-occupancy	608
Total ...	31,553
7. Rent-free holders	6,205
GRAND TOTAL ...	37,758
8. Under-raiyats	2,204

The average area of holdings is as follows:—

Tenure-holders ...	55
Settled raiyats ...	3
Non-occupancy raiyats ...	1

108. The total number of objections filed under section 106 was 2,073, of which 192 were disposed of during, and the balance before, the commencement of, the year. The total number of applications for settlement of rent under section 104, clause (2), was 162, of which 73 were disposed of during the year under report. The total number of tenants in the estate is 8,497, and the amount of fair rent settled is Rs. 86,295. Of this the fair rents of 3,797 tenants, amounting to Rs. 38,547, was settled during the year.

109. The settlement has resulted in an increase of rental amounting to Rs. 18,167, the new rental being Rs. 86,295 and the old Rs. 68,128, while the Government revenue is only Rs. 21,602.

	Rs.	A.	P.
Average rate per acre on cultivated rent-paying area ...	3	13	0
Average rate per acre on the rent-paying area cultivated and uncultivated	3	6	6

110. The total expenditure has been Rs. 37,449-3-4, of which Rs. 5,223-11-6 was incurred during the year under report. Deducting Rs. 5,025-10-0 realised on account of process fees, &c., the net cost stands at Rs. 32,423-9-4, or annas 13-8$\frac{8}{9}$ pie per acre. Of this amount Rs. 18,921-12-8 falls to the share of the Rajah, and Rs. 13,501-12-8 to that of the tenants (inclusive of holders of rent-free lands).

111. The Settlement Officer was on tour for 196 days, as noted below :—

(*a*) Dubalhati estate (district Rajshahi)	...	43 days.
(*b*) Mollarpore estate (district Birbhum)	...	146 „
(*c*) Ruksole estate (district Champaran)	...	7 „
Total	...	196 „

CHITTAGONG DIVISION.

Private Estates in Tippera.

112. *Jowar Alakdia Durgapur.*—This is a small estate belonging to the Maharajah of Hill Tippera. Rates were determined in November 1890 after disposal of the objections presented by the raiyats, and draft khatians were published in May 1891, the records being finally published in September 1891. The estate has an area of 1,264 acres in eight villages. The survey, which was finished before September 1890, cost Rs. 857-7-3 and settlement Rs. 226-8-2. An increase of Rs. 1,099 has been obtained in the rental, and is due to the assessment of excess land. Deputy Collector Babu Rajani Kumar Datta, who is in charge of settlement work in the district, had his head-quarters at Comilla and was out on tour on settlement work on this and other estates for 125 days.

BHAGALPUR DIVISION.

Sonthal Parganas private zamindar's Estates.

113. The survey and settlement of 18 private permanently-settled estates in this district, comprising 1,430 villages, with an area of 441,510 acres, of which 203,018 are cultivated and 238,492 uncultivated, was in progress during the year.

(*a*) *Survey.*—The work that remained to be done at the close of the field season 1889-90 was the survey and measurement of 420 villages. On the 1st November 1890 the Settlement Officer, Mr. Craven, took the field with two assistants, Babus Ras Behary Dutt and Jogendra Chandra Bhanja. There were three field parties, one being under the immediate charge of the Settlement Officer and the two others under the two assistants. In the middle of December a third Assistant Settlement Officer, Babu Baloram Das Gupta, was appointed to relieve the Settlement Officer of the personal charge of his party, which was then working in the Jamtara subdivision. The supervising staff was further strengthened in February last by the appointment of a kánungo to each party. The party working under Babu Ras Behary Dutt, in the Godda subdivision, surveyed the boundaries and measured in detail the fields of 176 villages, covering an area of 31,709 acres of cultivated land and 12,753 acres of uncultivated land comprised in 103,900 plots. The Dumka party under Babu Jogendra Chandra Bhanja surveyed the boundaries and measured in detail 66 mauzas, consisting of 13,606 acres of cultivated land and 20,560 acres of uncultivated land, the whole area being comprised in 97,400 plots. The party in Jamtara under Babu Baloram Das Gupta surveyed the boundaries of, and measured in detail, 178 villages, with an area of 29,160 acres of cultivated land and 49,376 acres of uncultivated, consisting of 210,000 plots. The boundaries were surveyed with plane-table. The writing up of the khasras and the plotting of the fields was done on the field as the work proceeded. The field work of the three parties was completed on the dates below mentioned:—

The Dumka party	...	...	...	21st January 1891.
„ Godda „	...	...	...	28th February „
„ Jamtara „	...	...	...	21st March „

(*b*) *Fixation of rents.*—Rules for fixing rents were drafted and published within the second half of the year under report, and were approved by His Honour the Lieutenant-Governor, who also issued instructions for the guidance of the Settlement Officer. The rents of 55,000 holdings had to be revised and recalculated in accordance with these rules; this work was done by the end of August 1891. Besides attending to office work, the Settlement Officer was engaged in drawing up proceedings, fixing the assessments, and in making

enquiries as to the fitness of certain headmen. The rents fixed have been accepted without objection. To the end of the year under report draft khatians have been published for 574 out of the 1,430 villages. The work is expected to be prolonged beyond October 1891, by which time it was anticipated that it would have been finished. The delay is attributed to the want of forms indented for in February, and not supplied by the Stationery Office up to date of the Settlement Officer's report. The total expenditure to the end of the year was Rs. 1,23,078. An increase of rent of Rs. 55,491-12-0 was obtained on a previous rental of Rs. 1,59,326-6.

114. The time spent in camp by the Settlement Officer and his assistants, is as follows:—

Settlement Officer, Mr. J. A. Craven	...	...	133 days.
Babu Jogendra Chandra Bhanja, Dumka.	Assistant Settlement Officer,		143 „
„ Ras Behary Dutt, Godda.	ditto	ditto,	151 „
„ Balaram Das Gupta, Jamtara.	ditto	ditto,	151 „

115. I was in charge of the Department up to the beginning of August, when I went on leave.

Mr. Maude was in charge of the office for the rest of the year.

I was on tour 104 days. Mr. Maude did no touring.

116. From the abstract annexed it will be seen (1) that the total area of Government estates and temporarily-settled tracts under survey and settlement, during the year, was 9,090 square miles, of which 2,381 miles had been surveyed prior to, and 1,397 miles were surveyed during the year under report; the total expenditure on survey and settlement from the beginning of the operations to the end of the year being Rs. 13,04,875, and the increase of revenue actually obtained being Rs. 1,10,078, or 8·44 per cent. on the outlay. This amount does not represent anything like the increase that will be obtained when the settlement operations are completed in Chittagong, Orissa, and Jalpaiguri, which are expected to yield an increase of revenue amounting to about eight lacs of rupees in addition to what has been actually obtained; (2) the total area of wards' estates under settlement is 1,995 square miles; the increase of rental actually obtained amounted to 6·96 per cent. on the outlay; and (3) the total area of private, permanently-settled estates, under survey and settlement was 816 square miles (inclusive of the Sonthal Parganas estates), the increase of rental obtained being 42·49 per cent. on the outlay.

117. From a revenue point of view, it is hoped that these results may be considered to be satisfactory. There has nowhere been any serious opposition to the proceedings, nor has any serious dissatisfaction with the results been expressed, on the part of either the landlords or tenants concerned.

I have the honour to be,

SIR,

Your most obedient servant,

M. FINUCANE,

Director of the Dept. of Land Records and Agriculture, Bengal.

R. D'R.—Reg. No. 3993J—1000-19-3-92.

APPENDIX

APPENDIX

Statement showing the Government Estates under Survey and

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed (cadastrally).			Number of villages of which the records have been handed over by the Survey to the Settlement Officer—	
						Up to 30th September 1890.	During the year under report.	Total area surveyed.	Up to 30th September 1890.	During the year under report.
1	2	3	4	5	6	7	8	9	10	11
Orissa ...	Cuttack ... / Puri ... / Balasore ...	The whole of the temporarily-settled estates, excluding Khurda, Angul, and Banki.	Not known; 2,243 surveyed	*4,798 sq. miles (3,070,720 acres), of which 236 are permanently settled and 4,562 temporarily settled, and revision survey of 363 miles.	Professional ...	231,040 or 361 sq. miles.	439,680 (687 sq. miles).	†670,720 (1,048 sq. miles).	...	1,301
	Cuttack ...	Angul	628	408,468 or 638 sq. miles.	Ditto ...	408,468 or 638 sq. miles.	...	408,468 or 638 sq. miles.	628	...
		Banki	144	76,800 or 120 sq. miles.	Ditto ...	76,800 or 120 sq. miles.	...	76,800 or 120 sq. miles.	144	...
Chittagong...	Chittagong	Sadar subdivision	933	1,040,640 (1,626 sq. miles), including 232,960 acres jungle and hill.	Ditto ...	243,200 (380 sq. miles).	294,400 (460 sq. miles), including 71,680 acres of jungle and hill.	537,600 840 sq mlies).	36	212 Of these 198 were prepared by Settlement Department.
		Old Thána Ramoo	50	156,390 or 244 sq. miles.	Ditto ...	156,390 or 244 sq. miles.	...	156,390 or 244 sq. miles.	50	...
Rajshahi ...	Jalpaiguri ...	Western Duars ...	Total number of jotes unknown. Mynaguri tahsil now under settlement, 3,507 jotes.	973,440 or 1,521 sq. miles. (Estimated area now under settlement 162,063.)	Ditto ...	330,483 or 517 sq. miles.	149,712 or 234 sq. miles.	480,195 or 751 sq. miles.	2,771 jotes.	3,430 jotes.
Dacca ...	Backergunge	27 char estates ...	27	64,060 or 100 sq. miles.	16 by professional and 10 by non-professional agency.	60,889 or 95 sq. miles.	...	60,889 or 95 sq. miles.	10 (by local agency).	16 (by the survey party).
Chittagong	Tippera ...	Singergaon ...	73	3,465	Non-professional	3,465	...	3,465	73	...
		Maizurdi ...	5	527	Ditto ...	...	527	527	...	5
	Noakhali ...	Char Peer Bux ...	1	5,176	Ditto ...	5,176 (or 26 sq. miles.)	10,003 (or 17 sq. miles.)	15,179 (or 43 sq. miles.)	1	...
		,, Fakira ...	1	2,748	Ditto ...					
		,, Gazi ...	1	7,255 (or 43 sq. miles.)	Ditto ...					
Dacca ...	Dacca ...	Jowar Joymangal	10	1,199	Ditto ...	1,199	...	1,199	10	...
Burdwan ...	Midnapore ...	Bhetia ...	23	6,698	Ditto ...	6,698	...	6,698	23	...
Presidency ...	Nadia ...	Khosalpore ...	13	425	Ditto ...	18	193	211	...	8
		Total Government Estates		5,818,011 or 9,090 sq. miles.	.....	1,523,826 or 2,381 sq. miles.	894,515 or 1,397 sq. miles.	2,418,341 or 3,778 sq. miles.	3,746	4,972

* This area is made up thus :—

Surveyed to September 1891—		
Permanently settled	102	
Temporarily settled	946	
	—	1,048
To be surveyed after 1891—		
Permanently settled	134	
Temporarily settled	3,616	
		3,750
		4,798 sq. miles.

A.

Settlement during the year ending 30th September 1891, (area surveyed, and cost).

Total cost—						Rate per acre.		Increase of revenue—		Remarks.
Up to 30th September 1890.		During year under report.		Total.						
Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Actually obtained.	Expected in addition.	
12	13	14	15	16	17	18	19	20	21	22
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs. A. P.	Rs. A. P.	Rs.	Rs.	
...	...	2,19,031	45,598	2,19,031	45,598	...	...	...	6,00,000	†In addition 447 miles have been traversed. Mr. Reily's report does not show the survey expenditure during the survey and settlement year. He gives the total expenditure up to 31st March 1891 as Rs. 1,25,677, and for the half-year 31st March to end of September Rs. 93,354—total Rs. 2,19,031; but it is not clear whether this includes expenditure on survey before the 1st October 1890.
26,495	6,043	1,02,998	48,097	‡1,29,493	54,140	0 4 0	0 2 6	§54,486	...	‡ This is taken from Mr. Patterson's final report. § This includes sarbaráhkárs' allowances, the exact amount of which is not yet settled. The increase will be progressive: half the amount for the first five years, three-fourths for the next five years, then the full amount.
25,097	10,920	...	1,678	25,097	12,598	0 5 2	0 2 8	‖8,185	...	‖ Settlement Officer does not state whether this increase is exclusive of sarbaráhkárs' allowances; apparently it is, as the increase in rent is Rs. 8,185.
92,602	22,211	1,32,540	58,892	2,25,142	81,103	¶0 3 3	¶0 1 2	...	1,20,000	¶ These rates are calculated on the whole area of the Sadar subdivision. The areas and cost shown against the Sadar Subdivision are given by the Settlement Officer and differ from those supplied by the Survey Department at page xlii of these appendices.
67,706	2,972	...	13,824	67,706	16,796	0 6 11	0 1 8	1,107	35,362	
2,15,325	32,226	1,10,784	30,459	3,26,109	62,685	0 10 8	...	36,210	60,000	The area in column 5 includes forests and jungle. The figure in column 8 has been supplied by the Survey Department, and is exclusive of 9,507·75 acres of revision survey. The survey officer's report does not show the total area of traverse, topographical and jungle survey up to and during the year under report and the area remaining to be done. He says only 6 miles of cadastral survey remained at the end of the year.
18,054 (13,841 by professional party and 4,213 by non-professional).	3,224	381	8,356	18,435	11,580	0 4 0	0 3 0	5,639	19,475	
2,554	587	...	118	2,554	705	...	...	2,311	...	
...	...	180	...	180	...	0 5 5½	...	391	...	
478	99	1,311	17	1,789	**116	0 1 10	0 0 2	551	...	** Only the salary of the temporary establishment, not that of the district staff, is charged.
221	94	...	67	221	161	0 2 11	0 1 3	...	1,106	
1,925	1,504	...	...	1,925	1,504	0 4 7	0 3 7	1,198	...	
39	...	166	...	205	...	...	...	...	34	The whole area was surveyed, but of this 211 acre represent the Government share in the estate.
4,50,496	79,880	5,67,391	2,87,106	10,17,889	2,86,986	...	...	1 10,078	8,35,977	

APPENDIX

Statement showing the Wards' Estates under Survey

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed (cadastrally).			Number of villages of which the records have been handed over by the Survey to the Settlement Officer—	
						Up to 30th September 1890.	During the year under report.	Total area surveyed.	Up to 30th September 1890.	During the year under report.
1	2	3	4	5	6	7	8	9	10	11
Burdwan ...	Burdwan ... Bankura ... Birbhum ... Midnapore ...	Burdwan Raj khas mehals ...	521	281,643 (440 sq. miles) and 650 miles of traverse survey of tauzis 1, 2, 3, in Bankura.	Professional ...	241,643 (378 sq. miles).	2,769 (4·34 sq. miles) cadastral with relaying boundaries and rectification of maps.	244,412 (382, sq. miles).	...	278*
	Birbhum ...	Hukumapur, Panchberia, and Chandnihat (Burdwan Raj khas mehals).								
	Midnapore ...	Sujamutha (Burdwan Raj khas mehals).								
Dacca ...	Backergunge ...	Dakhin Shabázpur ...	‡37	86,272 (135 sq. miles).	Partly by professional and partly non-professional.	79,718 (125 sq. miles).	154 (·24 sq. miles).	79,872 (125 sq. miles).	...	§14
Chittagong ...	Tippera ...	Serail	299	180,664 (282 sq. miles).	Professional ...	165,882 (259 sq. miles).	14.782 (23·10 sq. miles).	180,664 (282 sq. miles).	31	249
Bhágalpur	Bhágalpur ... Monghyr ... Purnea ... Malda ...	Srinagar-Banaili	‖680	447,189 (699 sq. miles).	Ditto and non-professional 81 sq. miles.	446,892 (698 sq. miles).	297 (·46 sq. miles).	447,189 (699 sq. miles).	675	5
Orissa ...	Cuttack ...	Kujang	461	146,856 (229 sq. miles).	Professional ...	146,856 (229 sq. miles).	...	146,856 (229 sq. miles).	447	14
		Kanika	632	¶282,240 (441 sq. miles).	Ditto ...	163,630 (256 sq. miles).	14,290 (22·33 sq. miles).	177,920 (278 sq. miles).	440	137
		Total Wards' Estates ...		1,424,864 (2,226 sq. miles).		1,244,621 (1,945 sq. miles).	32,292 (50·45 sq. miles).	1,276,913 (1,995 sq. miles).	1,593	697

Statement showing the Private Estates under Survey

Burdwan ...	Midnapore ...	Kesiari	41	5,120	Non-professional...	5,120	...	5,120	41	...
		Gur Moyna	1	407	Ditto ...	407	...	407	1	...
		Dakhin Moyna	1	468	Ditto ...	468	...	468	1	...
		Sudampore	1	145	Ditto ...	145	...	145	1	...
		Gur Safat	1	274	Ditto ...	274	...	274	1	...
		Changrachak No. 363	1	550	Ditto ...	...	550	550	...	1
		Nemack Mahal	8	3,924	Ditto ...	...	3,924	3,924	...	8
		Belabaria	6	822	Ditto ...	...	822	822	...	6
		Srikanta Kalaganda	1	173	Ditto ...	...	173	173	...	1
		Benagalsia	1	326	Ditto ...	...	326	326	...	1
		Maguri	5	1,774	Ditto ...	...	1,774	1,774	...	...
	Birbhum ...	Mollarpore	45	23,321	Ditto ...	21,711	1,819	23,530	...	45
Rajshahi ...	Rajshahi ...	Dubalhati	211*	41,794†	Ditto ...	41,794	...	41,794†	195	...
Chittagong ...	Tippera ...	Alakdia Durgapur	8	1,264	Ditto ...	1,264	...	1,264	8	...
Bhágalpur ...	Sonthal Parganas.	Sonthal Parganas	1,430	441,510 (690 sq. miles).	Ditto ...	284,346 (444 sq. miles).	157,164 (246 sq. miles).	441,510 (690 sq. miles).	...	...
		Total Private Estates ...		521,872 (815 sq. miles).		355,529 (556 sq. miles).	166,552 (260 sq. miles).	522,081 (816 sq. miles).	248	62

A— *concluded.*

and Settlement during the year ending 30*th September* 1891, (*area surveyed, and cost*).

Total cost—						Rate per acre.		Increase of rent—		Remarks.
Up to 30th September 1890.		During the year under report.		Total.						
Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Actually obtained.	Expected in addition.	
12	13	14	15	16	17	18	19	20	21	22
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs. A. P.	Rs. A. P.	Rs.	Rs.	
	...		...		...	...	...	...		* Figures taken from Mr. Shaw's report.
†1,03,425		18,982		1,22,407						† This figure is furnished by the Settlement Officer. The actual cost of survey to end of September 1890 has not been reported by the Survey Department.
	9,294		8,280		17,574	...	1 1 3	2,191	Not known.	‡ In addition to these, one village has been diluviated before the beginning of the year under report.
	5,850		8,960		14,810	...	0 8 2½	...		5·85 square miles of char land was omitted from cadastral survey.
36,045	3,228	8,141	6,410	44,187	9,638	0 8 2	...	...		§ These were the villages of which the khanapuri was done by the Survey Department. Maps of the remaining villages which had to be khanapurid by the Settlement Officer himself have also been handed over to him.
71,282	3,000	27,876	10,533	99,158	13,533	0 8 9	0 4 7	16,876	About 20,000	The Survey Department figures given at page xlii by the Survey Department differ from the figures supplied here by the Settlement Officer.
1,32,328	1,27,292	...	41,764	1,32,328	1,69,056	0 4 8	0 6 9	22,770	...	‖ Includes the 11 villages that were surveyed but were not settled, as the notification did not apply to them.
49,108	10,963	1,540	10,309	50,648	21,272	0 5 6	0 2 7	7,192	1,500	The rate per acre is calculated on 439,535 acres, the area actually settled.
60,226	3,297	6,173	5,669	66,399	8,966	0 6 0	...	4,530	6,000	¶ This includes 104,320 acres jungle surveyed on the 4" scale.
4,52,414	1,62,924	62,712	91,925	5,15,127	2,54,849	...	...	53,559	27,500	

and Settlement during the year ending 30*th September* 1891.

Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs. A. P.	Rs. A. P.	Rs.	Rs.	
3,146	2,548	...	465	3,146	3,013	0 9 10	0 9 5	2,508	...	
60	90	17	89	77	179	0 3 0	0 7 0	76	...	
70	73	18	78	88	151	0 3 0	0 5 2	11½	...	
20	38	7	40	27	78	0 2 11	0 8 9	9	...	
40	32	11	81	51	113	0 3 0	0 6 7	12½	...	
...	...	37	38	37	38	0 1 1	0 1 2	...	...	
...	...	360	264	360	264	0 1 6	0 1 1	...	...	
...	...	112	226	112	226	0 2 2	0 4 5	82½	...	* Out of 211 villages, 8 were exempted from survey, 1 was shown twice over in the Government notification, and the remaining 7 were demarcated within their asli mouzahs.
...	...	11	24	11	24	0 1 0	0 2 2	...	...	
...	...	...	19	...	19	...	0 0 11	...	...	† 4,136 acres excluded from settlement.
...	...	215	97	215	97	0 1 11	0 0 10	...	...	
6,467	...	658	5,864	7,125	5,864	0 4 10	0 3 11	277	2,323	
9,316	22,123	...	6,010	9,316	28,133	0 3 7	0 10 9	18,167	...	
857	...	...	227	857	227	0 10 10	0 2 10	1,099	...	
75,452		47,626		1,23,078		0 4 6		55,492	...	
19,976	24,904	1,446	13,522	21,442	38,426	...	...	77,734½	2,322	

The totals in columns 12 to 17 are exclusive of the figures for the Sonthal Parganas, separate figures for survey and settlement of which have not been received. Taking half of the Sonthal Pargana expenditure for survey and half for settlement, the totals for private estates will be—

	Rs.
(*a*) Survey	82,981
(*b*) Settlement ...	99,965
Total ...	1,82,946

APPENDIX

Statement showing progress made in Government Estates in record of rights

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which record of rights has been completed—		Total number of raiyats in the villages in column 4.
				Up to 30th September 1890.	During the year under report.	
1	2	3	4	5	6	7
Orissa ...	Cuttack ... ... / Puri ... ... / Balasore	The whole Division	2,243*	...	347	.....
	Cuttack	Angul	628	628	...	30,396
		Banki	144	130	14	23,969
Chittagong ...	Chittagong ...	Sadar subdivision	579	1‡	103‡	418,579
		Old Thána Ramoo	50	...	12	26,341
Rajshahi ...	Jalpaiguri	Western Duars	Mynaguri Tahsil, 3,507 jotes.	...	1,192	16,979§
Dacca ...	Backergunge ...	Char Budna	1	1	...	38
		,, Sitaram	1	1	...	38
		,, Chundrail	1	1	...	96
		,, Shambupura	1	1	...	505
		,, Golakpura	1	1	...	346
		,, Padma	1	1	...	534
		,, Lord Hardinge	1	...	1	140
		,, Kali	1	...	1	17
		,, Joynagar	1	1	...	4,254
		,, Lamchipata	1	1	...	612
		,, Lamchi Koralmara ...	1	...	1	68
		,, Kristopershad	1	...	1	81
		,, Bhusan Lapta Madanpura	1	...	1	18
		,, Umed	1	...	1	180
		,, Bhairav including Price...	1	...	1	35
			1	...	1	
		,, Laksmi	1	...	1	139
		,, Koralmara	1	...	1	74
		,, Madhupura	1	...	1	1,468
		,, Goneshpura	1	...	1	1,266
		,, Lalmohan	1	...	1	1,045
		,, Bairagya	1	...	1	3,153
		,, Fasson	1	...	...	Nil
		,, Drummond	1	...	...	Nil
		,, Uday Kali	1	...	...	Nil
		,, Jangla	1	...	...	Not known yet.
		,, Kalachand	1	...	1	80
Chittagong	Tippera	Singergaon	73	73	...	906
		Maizurdi	5	...	5	140
	Noakhali ...	Char Peer Bux	1	...	1	136
		,, Fakira	1	...	...	.....
		,, Gazi	1	...	...	.....
Dacca ...	Dacca	Jowar Joymangal	10	10	...	394
Burdwan ...	Midnapore ...	Bhetia	23	23	...	796
Presidency ...	Nadia	Khosalpore	13	...	...	...
		Total Government Estates	...	873	1,689	532,823

Statement showing progress made in Wards' Estates in record of rights

Burdwan ...	Birbhum	Hukumapur, Panchberia, and Chandnihat (Burdwan Raj khas mehals).	90	90	...	2,420
	Midnapore	Sujamutha	66	34	32	12,152
Dacca ...	Backergunge ..	Dakhin Shabázpui	37	...	(a)3	85,000†
Chittagong ...	Tippera	Sera	299	...	137	84,166
Bhágalpur ...	Bhágalpur ... ... / Monghyr ... ... / Purnea ... .. / Malda	Srinagar Banaili	(c)669	625	44	60,966‡
Orissa ...	Cuttack	Kujang	461	98	348	36,104
		Kanika	632	4	194	32,098
		Total Wards' Estates ...	...	851	758	312,906

(a) That is, villages of which the final publication of the records has been made.

(c) The number of villages here given differs from statement A, as 11 villages were surveyed and subsequently excluded from settlement.

B.

and settlement of rents during the year ending 30th September 1891.

NUMBER OF RAIYATS WHOSE RENT HAD BEEN RECORDED AND STATUS DETERMINED.			TOTAL RENTAL OF TENANTS WHOSE RENTS HAVE BEEN SETTLED.				REMARKS.
Up to 30th September 1890.	During the year under report.	Total of columns 8 and 9.	According to new settlement.	According to previous jamabandi.	Increase.	Decrease.	
8	9	10	11	12	13	14	15
			Rs.	Rs.	Rs.	Rs.	ORISSA.—Rents existing said to be recorded, amounting to Rs. 59,284.
...	29,190	29,190	...	...	...	...	* This represents the total number of villages surveyed.
30,396	...	30,396	1,00,515	46,029	54,486†	...	† This increase is progressive.
21,922	2,047	23,969	32,932	24,747	8,185	...	
3,637	33,342	36,979	...	...	...	...	‡ The attestation only has been completed in these villages.
10,952	15,389	26,341	90,126	53,657	36,469	...	
...	16,979	16,979	70,627	34,417	37,334	1,124	§ These are the tenants in the 3,507 jotes mentioned in column 4.
38	...	38	2,887	2,229	658	...	
38	...	38	768	393	375	...	
96	...	96	2,084	1,846	238	...	
505	...	505	12,164	9,166	2,998	...	
346	...	346	11,884	9,507	2,377	...	
534	...	534	11,575	8,507	3,068	...	
...	140	140	841	200	641	...	
...	17	17	196	64	132	...	
4,254	...	4,254	49,904	43,982	5,922	...	
612	...	612	9,972	9,297	675	...	
...	68	68	1,598	634	964	...	
...	81	81	2,983	456	2,527	...	
...	18	18	390	101	289	...	
...	180	180	5,157	930	4,227	...	
...	35	35					
...	139	139	2,707	1,213	1,494	...	
...	74	74	5,963	634	5,329	...	
...	1,468	1,468	...	...	...	...	
...	1,266	1,266	...	...	...	...	
...	1,045	1,045	...	...	...	...	
...	3,153	3,153	...	...	...	...	
...	...	...	...	...	...	...	
...	...	...	...	...	...	...	
...	...	...	...	...	...	...	
...	...	...	...	...	...	...	
...	80	80	693	235	458	...	
906	...	906	7,141	4,830	2,311	...	
...	140	140	1,265	874	391	...	
116	20	136	3,145	2,594	551	...	
...	...	...	...	...	...	...	No settlement work was done on these two estates during the year under report.
...	...	...	...	...	...	...	
...	394	394	1,618	512	1,106	...	
796	...	796	2,869	1,671	1,198	...	
...	...	...	...	...	...	...	No work has been done.
75,148	105,265	180,413	432,004	2,58,725	1,74,403	1,124	

and settlement of rents during the year ending 30th September 1891.

			Rs.	Rs.	Rs.	Rs.	
2,211	209	2,420	15,009	12,818	2,191	...	
3,534	8,618	12,152	80,918	86,106	...	5,188*	* This figure is incorrect; the rent settled will be equal to, or slightly in excess of, existing rent.
...	8,067	8,067	6,747	6,967	...	(b) 220	† This represents the approximate number of holdings of which separate khatians have been prepared, not the number of tenants.
...	15,773	15,773	92,871	75,995	16,876	...	
57,119	3,847	60,966	3,52,606	3,29,836	30,186	7,416	‡ Exclusive of under-raiyats.
4,662	28,841	33,503§	1,15,248	1,08,056	7,192	...	§ Includes 3,000 under-raiyats.
109	7,848	7,957	33,428	28,898	4,530	...	
67,635	73,203	140,838	6,96,827	6,48,676	60,975	12,824	

(b) This decrease is nominal. The three villages of which the settlement was completed were subject to diluvian. The nominal rental is Rs. 292, the actual realizations only Rs. 19.

APPENDIX

Statement showing progress made in Private Estates in record of rights

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which record of rights has been completed—		Total number of raiyats in the villages in column 4.
				Up to 30th September 1890.	During the year under report.	
1	2	3	4	5	6	7
Burdwan ...	Midnapore ...	Kesiari	41	41	...	2,454
		Gur Moyna	1	1	...	158
		Dakhin Moyna	1	1	...	182
		Sudampore	1	1	...	54
		Gur Safat	1	1	...	171
		Changrachak No. 363	1	...	...	237
		Nemuck Mahal	8	...	...	1,505
		Belabaria	6	...	6	335
		Srikanta Kalaganda	1	...	...	76
		Benagalsia	1	...	...	117
		Maguri	5	...	...	...
Burdwan ...	Birbhum ...	Mollarpore	45	...	45	3,997
Rajshahi ...	Rajshahi ...	Dubalhati	211	195	..	8,497
Chittagong ...	Tippera ...	Alakdia Durgapur	8	...	8	361
Bhagalpur ...	Sonthal Parganas ...	Sonthal Parganas	1,430	1,430		54,620*
		Total Private Estates ...	... ...	240	59	72,764

NOTE.—The totals in columns 5 and 6 are exclusive

APPENDIX

Abstract of Appendix A, showing progress and expenditure on Government estates,

Estates.	Total area surveyed.						Total		
	Up to 30th September 1890.		During the year under report.		Total.		Up to 30th September 1890.		
	Acres.	Square miles.	Acres.	Square miles.	Acres.	Square miles.	Survey.	Settlement.	Total.
1	2	3	4	5	6	7	8	9	10
Government estates ... ... (Estimated area acres 5,818,011 = 9,090 square miles.)	1,523,826	*2,381	894,515	1,397	2,418,341	3,778	Rs. 4,50,496	Rs. 79,880	Rs. 5,30,376
Wards' estates ... ... (Estimated area acres 1,469,985 = 2,297 square miles.)	1,244,621	†1,945	32,292	50·45	1,276,913	1,995	4,52,414	1,62,924	6,15,338
Private estates ... ... (Estimated area acres 5,21,872 = 815 square miles.)	355,529	‡556	166,552	260	522,081	816	19,976	24,904	1,20,332
							75,452 (Sonthal Parganas.)		
Total ...	3,123,976	4,882	1,093,359	1,707·45	4,217,335	6,589	9,22,886	2,67,708	12,66,046
							75,452		

Average cost of survey on total area
Ditto settlement ditto

B—*concluded.*

and settlement of rents during the year ending 30th September 1891.

NUMBER OF RAIYATS WHOSE RENT HAD BEEN RECORDED AND STATUS DETERMINED.			TOTAL RENTAL OF TENANTS WHOSE RENTS HAVE BEEN SETTLED.				REMARKS.
Up to 30th September 1890.	During the year under report.	Total of columns 8 and 9.	According to new settlement.	According to previous jamabandi.	Increase.	Decrease.	
8	9	10	11	12	13	14	15
			Rs.	Rs.	Rs.	Rs.	
2,454	...	2,454	8,394	5,886	2,508	...	
158	...	158	1,609	1,533	76	...	
182	...	182	1,804	1,793	11	...	
54	...	54	730	721	9	...	
171	..	171	946	933	13	...	
...	...	...	...	...	...	...	
...	...	...	...	...	...	...	
...	335	335	1,002	919	83	...	
...	...	...	...	...	...	...	
...	...	...	...	...	...	...	
...	...	...	...	...	...	...	
...	3,997	3,997	2,003	1,726	277	...	
8,497	..	8,497	86,295	68,128	18,199	32	
...	361	361	4,295	3,196	1,099	...	
...	...	54,620*	2,14,818	1,59,326	55,492	...	* Includes 12,443 sub raiyats.
11,516	4,693	70,829	3 21,896	2,44,161	77,767	32	

of the figures for the Sonthal Parganas.

temporarily-settled tracts, Wards' and Private Estates now under survey and settlement.

COST.						INCREASE OF REVENUE OR RENT.				REMARKS.
During the year under report.			Total.			Actually obtained.	Expected in addition.	Total of columns 17 and 18.	Percentage of increase actually obtained on total outlay on total cost, columns 16 and 17.	
Survey.	Settlement.	Total.	Survey.	Settlement.	Total.					
11	12	13	14	15	16	17	18	19	20	21
Rs. 5,67,391	Rs. 2,87,106	Rs. 8,54,497	Rs. 10,17,889	Rs. 2,86,986	Rs. 13,04,875	Revenue. Rs. 1,10,078	Rs. 8,35,977	Rs. 9,46,055	8·44	* Exclusive of estates of which survey and settlement previously completed.
62,712	91,925	1,54,637	5,15,127	2,54,849	7,69,976	53,559	27,500	81,059	6·96	† Sunkerpore, Chooramon, and Maldwar, of which survey and settlement completed, are excluded.
1,446	13,522	62,594	21,442	38,426	1,82,946	77,734½	2,323	80,057½	42·49	‡ Exclusive of estates of which survey and settlement were completed before the year.
47,626			1,23,078							
6,31,549	3,92,553	10,71,728	15,54,458	5,80,261	22,57,797	2,41,371½	8,65,800	11,07,171½	10·69	
47,626			1,23,078							

	Rs.	A.	P.	
cadastrally surveyed is	0	6	1½	per acre.
ditto is	0	2	5	ditto.
Total ...	0	8	6½	

APPENDIX D.

No. 1706, dated Cuttack, the 28th November 1891.

From—H. R. Reily, Esq., Settlement Officer, Cuttack,
To—The Commissioner of the Orissa Division.

With reference to the Government Circular No. 15TA, dated the 17th October 1891 calling for a report on the progress made in survey and settlement of Orissa for the half-year ending 30th September 1891, I have the honour to submit the following report.

2. There has been some delay in submitting this report, due to the fact that while on leave at Darjeeling His Honor the Lieutenant-Governor drew my attention to certain errors and discrepancies which were found to exist in the figures contained in the progress report submitted for previous months, and I was anxious on my return (on the 2nd November) to reconcile these errors before submitting the present report.

3. The area of the three districts is given differently by different authorities, and I have met with very great difficulties in my endeavours to get at anything like accurate figures for the three districts. It was only on the 17th November that I got the corrected figures for Cuttack. I have in the present return adhered, and intend in future to adhere, to the areas given in the revenue survey records. These figures are more likely to be accurate than those taken from other sources.

4. I give in the margin the area of each of the three districts of Cuttack, Puri, and Balasore. I think it advisable, however, to treat each district in detail, as the matter is somewhat complicated by the fact that in some cases the area of Angul and Banki has been included within the area of the Cuttack district, while in other cases the area of these two estates has been excluded. Then, again, the entire area of Kanika has been taken as lying within the ambit of the Cuttack district. This is not so. A large portion (177 square miles) of this estate falls within the ambit of the district of Balasore.

	Square miles.
Cuttack	4,577
Puri	2,504
Balasore	2,060
Total ...	9,141

5. In Puri, also, a small portion of the permanently-settled area has been surveyed without the previous knowledge or consent of the District Officers, and this area has been included in the returns and statements prepared and submitted by the Survey Department, but which do not find a place in the returns and statements submitted by my office, and these discrepancies have hitherto caused confusion in our returns.

6. The statement given below shows in detail the total area of Cuttack:—

Cuttack.

Nature of Estate.	Total area.	Previously surveyed.	Surveyed in 1878 for irrigation purposes but now requires revision.	Area of new survey up to last return, 30th September 1891.	Total of columns 3, 4, and 5.	Area remaining to be surveyed.	Traversed up to 30th September 1891.	Area demarcated up to 30th September 1891.	Balance.	Area eliminated.	Area remaining to be demarcated.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13
Permanent-settled estates	1,483	623	19	66	708	775	...	40	735	356	379	* Out of this area, demarcation is in progress in 1,000 square miles, and will be ready for traverse by the 30th December at the latest.
Temporary-settled estates	3,094	999	344	257	1,600	1,494	282	386	826	...	826	
Total ...	4,577	1,622	363	323	2,308	2,269	282	426	1,561	356	1,205*	

The total area of Cuttack, it will be seen, is given in the survey records as 4,577 square miles. This includes the two Government khâs mâhâls of Angul and Banki, and the permanent-settled estates. Of this area, 1,483 square miles are permanently-settled and 3,094 square miles are temporarily-settled estates.

7. Of the permanent-settled area,* viz., 1,483 square miles, the following estates have already been surveyed:—

* *Permanent-settled estates.*

	Square miles.
1. Killah Aul	80·60
2. Bisunpur	17·51
3. Chhedra	3·37
4. Durpan	100·91
5. Dompara	84·83
6. Harishpur	62·09
7. Madhupur	60·58
8. Patia	42·21
9. Kujang	358·38
10. Kanika	265·40
11. Sukinda	338·66
12. Kalkala	17·56
13. Derabisi	50·85
Total ...	1,482·95

	Square miles.
(*a*) Kujang (season 1888-89) and ...	358
(*b*) That part of Kanika which lies in Cuttack (season 1888-89) ...	265
Total ...	623

8. If this previously surveyed area, viz., 623 square miles, is deducted from the total permanent-settled area (1,483-623), there remains an area of 860 square miles still unsurveyed. Of this area, viz., 860 square miles, a portion of one pargana Derabisi, No. 33 in the accompanying map (19 square miles), was surveyed in 1878 for irrigation purposes, and portions of the following permanent-settled

estates were surveyed in 1890-91, as these lands fall within the irrigated tract (High Level Canal) :—

1. Portion of Madhupur (season 1890-91), No. 9 in map ...	11
2. Portion of Darpan, No. 39 in map	50
3. Chausatipara in 1890-91, No. 10 in map	5
Total ...	66

But as a revision survey is necessary of the 19 square miles of pergunnah Derabisi, I have not entered these 19 square miles in column 3 of the statement given above as *already surveyed.* The permanent-settled area still unsurveyed would, therefore, be 794 square miles, of which 775 would have to be a new, and 19 square miles a revision survey.

9. The recent Government orders state that only such of the permanently-settled area as come "within our stride" while surveying the temporary-settled area should be cadastrally surveyed. A map accompanies this report, giving the exact position of each of the permanent-settled estates. There are really, in my opinion, only two estates that may be said not to come within our stride, viz :—

	Square miles.
1. Sukinda, No. 1 in the map	338·66
2. Kalkala, No. 40 in the map... ...	17·56
Total ...	356·22

This would reduce the area of permanent-settled to be surveyed to 438 square miles :—

	Square miles.
Permanent-settled area	794
Minus Sukinda and Kalkala	356
Total ...	438

All the other permanent-settled estates in my opinion come within the definition given in His Honor the Lieutenant-Governor's note of 19th October 1891, and will have to be surveyed, and a record of rights undertaken. As an Appendix to this report I give the names of all permanent-settled estates in each of the three districts of Cuttack, Puri, and Balasore in statements X, Y, Z, and the reasons in detail why, in my opinion, a survey and record of rights seems necessary in each case.

10. The total temporarily-settled area in Cuttack is given as 3,094 square miles. Of this, 999 square miles included in Angul and Banki have been surveyed and settled prior to 1890-91, and would, therefore, have to be excluded, leaving an area of 2,095 square miles. Of this area 344 square miles including either the whole, or a portion, of 18 pergunnahs comprising the irrigated tracts, was cadastrally surveyed in 1878; but as a revision survey of this area is necessary, I have not excluded these three hundred and forty-four (344) square miles from the area to be surveyed. The figures would, however, stand as follows :— New survey 1,751 square miles, revision survey 344 square miles. Of this 1,751 square miles where a new survey was necessary the cadastral survey of 257 square miles was completed by the close of the past season 1890-91. There would, therefore, remain 1,494 square miles of new survey still unfinished, and 344 square miles of revision survey. The area to be surveyed in Cuttack would be as follows :—

		Square miles.
Temporary-settled area		1,494
Permanent-settled area		419
Revision of area cadastrally surveyed in 1878, see column 10 of statement, page 2	Permanent-settled ...	19
	Temporary-settled ...	344
Total ...		2,276

Explanation of difference of 7 square miles between statement balance of paragraph 6 "to be completed" and that shown in body of report.

Nature of Estate.	Area.	Area surveyed.	Balance.	Omitted.	To be surveyed.	Revision.	Remarks.
Permanent-settled ...	1,483	689	794	356	419	19	* An area of 356 square miles has been omitted and 363 square miles to be surveyed, difference 7 square miles.
Temporary-settled ...	3,094	1,286	1,838	...	1,494	344	
Total ...	4,577	1,945	2,632	356*	1,913	363*	

Puri.

11. The statement given below shows in detail the total area of Puri:—

Nature of Estate.	Total area.	Previously surveyed.	Surveyed in 1878 for irrigation purposes but now requires revision.	Area of new survey up to last return, 30th September 1891.	Totals of columns 3, 4, and 5.	Area remaining to be surveyed.	Traversed up to 30th September 1891.	Area demarcated up to 30th September 1891.	Area remaining to be demarcated.	Remarks.
1	2	3	4	5	6	7	8	9	10	11
Permanent-settled area...	192	...	...	36	36	156	...	...	156	In progress of demarcation.
Temporary ditto ...	2,304	972	...	689	1,661	643	165	143	335*	* Area of lake Chilka.
Total ...	2,496	972	...	725	1,697	799	165	143	491	

The total area of Puri, it will be seen, is given in the Survey Records as 2,496 square miles. This includes Khorda and all the permanent-settled estates. Of this area 192 square miles are permanent-settled and 2,304 are temporarily-settled estates.

12. The two permanent-settled estates (1) Andhari, No. 6 in map, (2) Manikpatna, No. 2 in map, were surveyed prior to my arrival in the district. This survey was undertaken by the Survey Department under a mistaken impression that the permanent-settled estates were to be surveyed. The area thus surveyed amounts to 36 square miles; and now that the work has been completed, and I understand the records are ready and are lying in the Survey Office, I think the best course would be for Government to order a record of rights in these two estates. If the area of these two above-mentioned estates are deducted from the total permanent-settled area (that is 192 square miles minus 36 square miles), we would still have left 156 square miles of permanent-settled estates in Puri remaining to be surveyed. The situation of the four remaining estates (Nos. 1, 3, 4, and 5 in the map) are given in the accompanying map of Puri. It will be seen that the area is small, viz., 156 square miles, and considering the situation of the estates, I think a record of rights should be made of these four estates.

13. The temporarily-settled area in Puri is given as 2,304 square miles. Of this 972 square miles of Khorda has already been surveyed and settled, and must therefore be excluded, leaving an area of 1,332 square miles, which had to be surveyed.

14. Of the 1,332 square miles, 689 square miles have been cadastrally surveyed during the season 1890-91, leaving an area of 643 square miles to be surveyed in the coming season. Of this area, however, the Chilka lake covers 344 square miles. The actual cadastral work will not extend over 340 square miles.

Balasore.

15. The total area of Balasore is shown in detail in the statement following:—

Nature of Estate.	Total area.	Previously surveyed.	Surveyed in 1878 for irrigation purposes but now requires revision.	Area of new survey up to last return, 30th September 1891.	Total of columns 3, 4, and 5.	Area remaining to be surveyed.	Traversed up to 30th September 1891.	Area demarcated up to 30th September 1891.	Area remaining to be demarcated.
1	2	3	4	5	6	7	8	9	10
Permanent-settled area	411	177	...	...	177	234	...	...	234
Temporary ditto	1,823	...	...	...	...	1,823	...	283	1,540
Total ...	2,234	177	...	...	177	2,057	...	283	1,774

The total area of Balasore is given as 2,234 square miles. Of this 411 square miles are permanent-settled and 1,823 square miles are temporary-settled estates. Of the permanent-settled area, viz., 411 square miles, 177 square miles, the portion of Kanika ward's estate, lying within Balasore, was surveyed in season 1889-90, and is now, I believe, under settlement. If this area is deducted from the total permanent-settled area, we have left an area, of 411—177=234 square miles. This area consists of 10 small estates, all of which fall within the definition given in paragraph 13 of His Honor the Lieutenant-Governor's note, dated 19th October 1891, that is, they came "within our stride" when surveying the temporary-settled

area. In fact, in 8 out of 10 estates the permanent-settled villages are, I believe, interlaced with temporary-settled villages, and in these 8 cases there can be no doubt about its being absolutely necessary to make a survey and record of rights. In the two remaining cases (parganas Bhograi, No. 5 in map, and Fatehabad, No. 1 in map, respectively), it will be seen on a reference to the map that they are surrounded by temporary-settled areas, and in my opinion must be brought under survey and a record of rights made. I am unable to give the area of each individual estate, as this is unknown to me at present. Even in the two mahals, Bhograi, No. 5 in the map, and Fatehabad, No 1 in the map, the entire pargana is not held under a permanent lease. Only portions of the pargana, it is said, are held under permanent-settled tenure, and until I ascertain the area of the villages held and under a permanent lease, I cannot give the area of each individual estate. But the total area has been ascertained and given, and may be treated as approximately accurate.

16. The temporarily-settled area amounts to 1,823 square miles, and no portion of this area has been surveyed up to date. In fact, no cadastral or traverse survey has been made up to date in Balasore. All that has been done is that 283 square miles have been demarcated and are ready for traverse work this season, and we hope to get a further area of 800 square miles ready for traverse by the end of December, and, if necessary, another 500 square miles will be ready demarcated by the end of March, or a total area ready demarcated of 1,300 square miles before the close of the season.

17. *Information as to the work done by the Settlement Officer and his assistants, showing the distribution of work to each officer, his head-quarters, and the number of days he was absent on tour.*

The following six circles were established in the districts of Cuttack and Puri :—

1. Tangi ... ... } District Cuttack.
2. Jagatsinghpur ... }
3. Rahang ... ... }
4. Karmala ... ... } District Puri.
5. Lembai and Kotrang... }
6. Pipli ... ... }

18. The circles' head-quarters of each of the Assistant Settlement Officers, and the names of the Assistant Settlement Officers who were in charge of each of the circles during the half-year, are shown in the statement given below, and the number of days each Assistant Settlement Officer was absent from head-quarters :—

District.	Name of circle.	Head-quarters of Assistant Settlement Officers.	Officers who have held charge.
Cuttack ...	Tangi ...	Tangi ...	Babu Chaku Lal Sirkar, from April to 13th July 1891. Ambika Charan Sen, Esq., from 14th July to 3rd August 1891. Babu Chakulal Sirkar, from 4th August to 3rd September 1891, and Ambica Charan Sen, Esq., from 4th to 30th September 1891.
Ditto ...	Jagatsinghpur	Jagatsinghpur	Ernest Herbert Cooper Walsh, Esq., was in charge from April to 5th May 1891. James Taylor, Esquire, from 18th May to 9th September 1891. Babu Harish Chunder Roy, from 10th to 30th September 1891.
Puri ...	Rahang ...	Puri ...	Barada Charan Mitra, Esq., from 8th March to 5th May 1891. Ernest Herbert Cooper Walsh, Esq., was in charge from 6th May to 30th September 1891.
Ditto ...	Karmala ...	Karmala ...	Tehuruddin Ahmad, Esq., from 8th March to 30th September 1891.
Ditto ...	Lembai and Kotrang.	Kanti ...	Debendranath Mukerjee, Esq., prior to my taking charge to 13th July 1891. Babu Chakulal Sirkar, from 14th July to 3rd August 1891. Debendra Nath Mukerjee, Esq., from 4th to 21st August 1891. Ernest Herbert Cooper Walsh, Esq., from 22nd August to 30th September 1891.
Ditto ...	Pipli ...	Pipli ...	Surjakumar Agasti, Esq., from 30th March to 16th August 1891, and Ernest Herbert Cooper Walsh, Esq., from 22nd August to 30th September 1891.

The following table shows the number of days each officer was absent from head-quarters on tour:—

Name of circle.	Name of officer.	Number of days the officer was absent on tour from head-quarters.	Remarks.
Jagatsinghpur ...	Ernest Herbert Cooper Walsh, Esq.	28 days.	
	James Taylor, Esq. ...	13 „	
	Babu Harish Chunder Roy ...	10 „	
		51 days.	
Tangi ...	Babu Chaku Lal Sirkar ...	43 days.	
	Ambika Charan Sen, Esq. ...	22 „	Was in charge of the Settlement Office during the absence of the Settlement Officer.
		65 days.	
Rahang ...	Barada Charan Mitra, Esq., ...	11 days.	
	Ernest Herbert Cooper Walsh, Esq.	70 „	
		81 days.	
Serai and Chowbiskud.	Teheruddin Ahmad, Esq. ...	148 days.	
Lembai and Kotrang	Babu Chakulal Sirkar ...	31 days.	
	Debendranath Mukerjee, Esq....	108 „	
		139 days.	
Pipli ...	Surjakumar Agasti, Esq., ...	83 days.	
Settlement Officer...	Herbert Reade Reily, Esq. ...	83 days.	

Demarcation.

It will be seen that every considerable progress has been made in demarcation work since the 30th June 1891. The Government in their letter No. 421T—R, dated 23rd September 1891, intimated that they expected 1,400 square miles to be cadastrally surveyed in the current year, and a further area of 1,400 square miles to be traversed ahead ready for cadastral survey in the coming season. I was therefore called upon to get 2,800 square miles demarcated. I at first thought this would be impossible, more so, that during the rains, owing to the country being more or less under water, little or no work could be undertaken. I have, however. been able to get 852 square miles* demarcated and ready for the traverse camp to take the field whenever they may begin work. In addition to the 852 square miles, of which the demarcation has been completed, demarcation work is in progress in 28 parganas in Cuttack and three parganas in Balasore, and I expect to have a further area of 858 square miles ready for the traverse camp by the 31st December 1891. We will therefore have 1,710† square miles ready for traverse camp by the 31st December. To enable me to complete the area expected of me I will have to demarcate another 1,090 square miles, and I have very little doubt this can be done by the end of February.

	* P. S. area.	T. S. area.
Cuttack ...	40	386
Puri ...	...	143
Balasore ...	...	283
	40	812
Total	852	

	† P. S. area.	T. S. area.
Cuttack ...	71	1,015
Puri ...	...	143
Balasore ...	198	283
	269	1,441
Total	1,710	

The demarcation of Puri has been completed as far as the temporarily-settled area is concerned. This of course does not include the 335 square miles of lake Chilka. I have given instructions to the Assistant Settlement Officer to demarcate the 156 square miles of permanently-settled area during the current month. Even if it is decided not to cadastrally survey the remaining four permanently-settled estates, the demarcation of the area will have to be made in any case to enable us to complete our maps.

I understand His Honor to say that he wanted the survey of Cuttack to be taken in hand before we put our hand to Balasore. With this object in view I have made arrangements to get the entire temporary-settled area in Cuttack demarcated during the current season. And have also taken steps to get quite 800 to 900 square miles demarcated in

Balasore as well. I shall find no difficulty in future in keeping the demarcation work quite 1,000 to 1,400 square miles ahead of the traverse.

Final orders with regard to the permanent-settled area in Orissa have not been received up to date. I have therefore hitherto restricted the demarcation of the permanent-settled area to such estates as come within the irrigated area. I have very little doubt, however, that pargana Aul, No. 24 in the map, will eventually have to be surveyed, and I have therefore given orders to have this area demarcated in anticipation of the Government orders.

The entire staff of nine officers made over to me will be engaged in attestation and soil maps of the 1,048 (1,035 square miles shown was wrong, and the Survey Department has since supplied corrected figures, which is 1,048) square miles, which have been cadastrally surveyed, and of which we have received, or are about to receive, the records. I have no officer available to take up and dispose of the boundary disputes that will crop up when the 1,400 square miles are under survey. In the Director's note, without number and date, but which was evidently written in February last, and which contains a detail estimate for the Orissa survey and settlement, in paragraph 59 Mr. Finucane makes provision for two officers to do demarcation work, and also to supervise field work of amíns and dispose of boundary disputes. His Honor has given me one Sub-Deputy to do demarcation work. And this officer when he joins will be put in charge of the demarcation. But I have no officer to supervise the field work of over 1,400 square miles or to take up the boundary dispute cases. During the past year only 1,048 square miles were under survey, and there were 546 boundary dispute cases filed. This year the area to be surveyed, both cadastral and traverse, amounts to 2,800 square miles, and the number of boundary disputes will be quite 1,800 to 2,000. These cases will have to be taken up on the spot and disposed of, and I hope the Government will see their way to sending me at least two officers to dispose of these cases and also to supervise the amíns at work in the field. I don't think that highly-paid officers are necessary for work of this kind. But they must be officers who have had some knowledge of revenue work. It is excellent training for an officer who is to be put to settlement work the following year.

Survey Statement A.

The statement A given in paragraph 4 of the Government letter No. 455TR, dated the 24th September 1891, has been filled in, and is given as an appendix to this report.

Column 5 gives the total area to be surveyed, including such of the permanently-settled estates which in my opinion, for reasons given in paragraph 9 of this report, come within the definition of paragraph 13 of the Lieutenant-Governor's note dated 19th October 1891, but the permanently-settled and temporarily-settled areas are shown separately. I have excluded from this area all permanently-settled estates previously surveyed* and also the two† permanently-settled estates which in my opinion will not have to be surveyed.

* Previously surveyed excluding permanently-settled area	623
† Sukindá	338
Kulkalá	17
Total	978

Record Received (C).

The figures given in columns 10 and 11, "Records received by the Assistant Settlement Officers," are taken from the Survey Department returns. They do not agree with column 19 of statement B. The truth is, the Survey Department state that they have handed over 1,301 records, while the Assistant Settlement Officers only acknowledge to have received 1,160 records. The difference is 141.

Some two months ago a difference of this kind was detected by me, and on going into the matter I found that the Survey Department enter in their returns all records *despatched*, while the Assistant Settlement Officers only enter, in the return submitted by them, those records which have been *actually received*. I have written to the Survey Department to say that in future they must not enter in their returns any records as having been made over until the receipt from the Assistant Settlement Officer for such records is in their hands. Unless this is done there will be endless confusion.

Column 13.—The expenditure prior to my taking over charge is unknown to me, hence only such expenditure as has been incurred since I took over charge has been shown.

Column 15.—The details of Rs. 41,213 shown in this column are given below :—

		Rs.
1.	Amount disbursed on account of the salaries of the Settlement Officer, his establishment and contingencies from April to 30th September 1891, as shown in the cash-book at the Sadar Office, Cuttack	13,881
2.	Total of the contingent bills received for my countersignature from all Assistant Settlement Officers	14,304
3.	Salaries of the Assistant Settlement Officers	13,028
	Total ...	41,213

Statement B, Settlement.

Column 4 is blank. (Please see note in statement B).

Column 8.—Is blank as we cannot give the number of tenants for the entire area under survey. I don't see how this can ever be done until the entire records are received, and even then till the attestation is completed. The figures can only be treated as approximately

correct. I can of course give the information after collecting it from the road cess papers, but these will not be accurate, and moreover the road cess papers in this district are nine years old.

I have added columns 19 and 20, in which I have given the number of villages for which records have been received and the number of tenants in these villages. It will be seen that I have added a column No. 5, showing the total number of villages surveyed up to date. This will enable us to ascertain how many records are still due from the Survey Department.

It will be seen that 2,243 villages have been surveyed (column 5). Of this number we have received (column 19) the records of 1,160 villages. The number of records therefore which are still with the Survey Department amounts to 1,083. These records, I am informed, will be in my hands by the 15th December 1891.

I have also added three new columns, Nos. 12, 13 and 14, in which are given the number of plots in the area, the number attested up to 31st March, and the number attested during the half-year under report. The annexed statement shows the number of tenants whose status have been determined and the number of plots attested up to the close of the half-year ending 30th September 1891:—

Name of Circle.	Number of tenants whose status have been determined.	Number of plots attested.	Area in acres.	Number of plots attested each day.	Remarks.
Rahang ...	8,387	35,568	17,969	139*	Two months recess has been allowed, in which owing to rain and floods no attestation was possible. The working days of a month have been taken as 26 days in the other four months.
Lembai and Kotrang.	794	3,844	1,085	480	
Karmala ...	17,767	85,388	58,602	530	
Tangi ...	1,604	9,998	4,973	317	
Jagatsinghpur ...	638	3,244	1,123	463	* Mr. Walsh, it must be remembered, was in charge of three circles during the months of August and September, when Mr. Agasti and Mr. Mukhurji left. He had to see to the boundary disputes and attestation of all three of their circles. His time being taken up elsewhere, he was unable to devote his entire time to attestation in Rahang, hence the apparent smallness of work when compared with Mr. Ahmed, who was in uninterrupted charge of Karmala.
Total ...	29,190	1,38,042	83,752		Mr. H. C. Roy was engaged in attestation for seven days only, giving an average outturn of 463 plots per day.

The rate of progress in attestation is much impeded owing to the numerous errors that are found to exist in the khasras supplied by the Survey Department up to 30th September 1891. It will be seen that 138,042 plots were attested (column 3 of the statement given above). Out of this number, the Assistant Settlement Officers report that over 34 per cent. were found to be incorrectly recorded.

The tenants, on being called upon to hear the entries read out to them, state that they were not present when the survey was made; that the amíns would give them no information, and that they knew nothing about the entries made against their names. I have been on the spot and seen much of the attestation done before me. In a large portion of the cases the attestation-writer has to go out into the field and get almost every plot identified. All this extra work, due entirely to the fact that the records in their initial stage are, to say the least of it, carelessly done, takes up the time of the Assistant Settlement Officer uselessly. The idea that attestation is done by simply reading out to the assembled tenants the number and boundaries of the plots entered against the name of each individual tenant is a fallacy as far as Orissa is concerned, and it was on this that the estimate of work to be done was based.

This season I hope to have a jamabandi slip in use which each raiyat will have in his possession, and in which each plot and its boundary will be entered, and the tenant will be thus given an opportunity to get himself familiar with the plots put down to his name, and attestation will be made more easy. But in the absence of these jamabandi slips, and when the khasras have been made up without in any way consulting the tenant, the attestation officer has much trouble in getting an ignorant and pig-headed raiyat to consent to the entries entered against his name. This extra work has thrown the attestation work back very much, and is the cause of the poor outturn in many of the circles.

Then, again, the preparation of soil maps, and the necessary statements connected with it, take up a lot of the time of the Assistant Settlement Officer and his staff. I trust, therefore, that the Assistant Settlement Officers will not be expected to turn out the same standard of work as that found possible in Chittagong and elsewhere. As the officers become better acquainted with their work, a large outturn of work may be expected, and I have no doubt during the coming season the outturn of work will be much higher.

Khanapuri.

The enclosed statement marked C and D will show the progress made in khanapuri in the area surveyed in the districts of Cuttack and Puri up to 30th September 1891. In my opinion it would facilitate work and enable us to do our attestation much faster if the khanapuri were made over to the Settlement Department. This, I believe, has been done in Chittagong, and has answered admirably. I trust the Government will let us do our

own khanapuri next year. I have under recent orders of Government undertaken the khanapuri of the 363 square miles of the irrigated tracts in which revision survey is now in progress.

Fixation of rent.

The fixation of rent can only be determined after the status of the tenants and the existing rents paid by raiyats have been ascertained and recorded. For a record of the status of the tenants, please see column 10 of the statement B.

Assessment of Land Revenue.

No revised assessment of land revenue has yet been made.

Patwáris.

There were 464 patwáris in all, distributed as follows in the three districts:—

Cuttack	...	100
Puri	...	308
Balasore	...	56
Total	...	464

Of this number, during the months of March, April, and May, the only three months available for field work after I took over charge, the following patwáris were trained:—

Cuttack	...	64
Puri	...	181
Balasore	...	32
Total	...	277

The patwáris that refused to attend the training schools have been told that they have forfeited their appointments, and I would propose to dismiss all these men. Unless Government is prepared to do this and act firmly in this matter, all hope of getting any work out of these patwáris had better be abandoned.

In my letter No. 1421, dated the 26th September 1891, I have shown that the local patwári is such a lazy, incompetent man, that even though we get his services free, the cost of the area surveyed by him is almost double that of a paid agency. This is due to the fact that we have to keep up the same number of chainmen in either case, whether we utilize the services of the patwári or a professional amín, and the lazy, incompetent patwári only surveys three to four acres a day, while the paid agency survey from 10 to 16 acres, hence the cost of the chainmen is more than doubled when patwáris' services are utilized.

Kánungos.

There are 25 kánungos in Cuttack, 12 in Puri, and 12 in Balasore. The kánungos in Puri were made over to me by the Collector so far back as May last, and they have been employed in survey and settlement work. They have also carried out their own duties under an arrangement come to with the Collector.

In Cuttack the kánungos have not been made over to me as yet. I believe the Collector of Cuttack is now prepared to do so, and four men reported themselves to me on the 2nd November 1891. The remaining 21 men have not reported themselves yet.

In Balasore I have not yet taken over either the kánungos or patwáris, as no survey work has yet been undertaken in that district.

I believe all the kánungos are competent men, and will be able to supervise the work of amíns. I intend to use eight out of the 25 kánungos of Cuttack to supervise the khanapuri of the 363 square miles where a revision survey is in progress.

Boundary disputes.

The boundary disputes filed in the two districts of Cuttack and Puri aggregate 1,039.* Of this number 729 have been disposed of, leaving a balance of 310. I give below a tabular statement showing in detail the number for each circle:—

* Cuttack 132
Puri 907
Total ... 1,039

District.	Name of circle.	Total number of disputes.	Disputes settled up to 30th September 1891.	Disputes remaining to be settled.
Cuttack ...	Tangi	21	15	6
	Jagatsinghpur ...	111	...	111
Puri ...	Rahang	610	596	14
	Karmala	8	2	6
	Lembai and Kotrang ...	105	64	41
	Pipli	184	52	132
	Total ...	1,039	729	310

It will be noticed that the numbers pending in Tangi, Rahang, and Karmala circles are few. Moreover, all these cases that remain for disposal in these three circles are of a complicated nature, and in which the dispute cannot be settled till the Assistant Settlement Officer is in possession of further evidence.

The disputes in Jajatsinghpur and Pipli were not touched by Mr. James Taylor or Mr. Surjokoomar Agasti. The two officers* recently appointed to these circles have been instructed to take these disputes up and dispose of them.

* Mr. R. Nathan to Pipli.
Baboo Haris Chandra Roy to Jagatsinghpur.

In addition to the boundary disputes filed at the time of the cadastral survey, there are quite 717 disputes reported by the Demarcation Inspectors. These disputes refer to the 15† parganas under demarcation (Cuttack 546 and 141‡ in Balasore).‡ I have at present no officer specially deputed to supervise demarcation work. The Director of Land Records in his note on the survey and settlement of Orissa put down two Assistant Settlement Officers for this work. His Honor the Lieutenant-Governor determined to place at my disposal two Sub-Deputy Collectors for this work (His Honor's Note dated the 19th October 1891). These two officers have not yet joined. Pending their arrival these disputes will have to be disposed of by Mr. Sen and Mr. Walsh, and this will impede the work of attestation in their respective circles.

†1.	Jajpur.	8.	Tisania.
2.	Jodh.	9.	Painá.
3.	Dolegram.	10.	Shargarrah.
4.	Ahyás.	11.	Dalijoná.
5.	Katia.	12.	Madhupur.
6.	Bantrá.	13.	Kodindá.
7.	Kaima and Kismut-Kaima.	14.	Salio.
		15.	Bakrabad.

‡ These two do not make 717.
M.F.

APPENDIX X.

I give below my reasons why some of the permanently-settled estates should be surveyed and a record of rights made. I have treated each of the three districts separately.

Cuttack.

There are 13 permanently-settled estates in Cuttack. Of these two, viz. Kujung and Kanikà, have already been surveyed, and need not be taken into account. These would leave 11§ estates that have to be dealt with. His Honor the Lieutenant-Governor gave me to understand at Darjeeling that if the permanent-settled area was mixed in with the temporary-settled area, the survey must take them in its stride. And even if they lie outside, but irrigated by canal water, they must be surveyed. Bearing these directions in view, I have very little doubt that nine of the eleven estates will have to be surveyed. I propose to take each pargana separately.

Names of estates.		No. in map.	Area.
§1. Patea ...	...	51	42·21
2. Mudhupur	...	8	60·58
3. Dompárá	...	49	84·83
4. Aul ...	...	24	80·60
5. Bisunpur	...	82	17·51
6. Harichpur	...	83	62·09
7. Sukindá	...	1	338·66
8. Kalkálá	...	40	17·56
9. Chedrá	...	28	3·37
10. Derabisi	...	33	50·85
11. Durpun	...	39	100·91

A portion of these two estates have already been under survey, as they both come within the irrigated tract. I take it the remaining portion of these two estates will be cadastrally surveyed and a record of rights made.

		No. in map.	Area.
Durpun	...	39	100·91
Derabisi	...	33	50·85

This is a ward's estate. A portion of this estate has already been surveyed as it comes within the irrigated tract. The Collector has asked for a survey and settlement to be made of this estate on the part of the Court of Wards.

Mudhupur	...	9	60·58

A reference to the map will show that all the five marginally-noted estates are intermixed with the temporary-settled area, and may be said to come "within our stride," and would therefore come under survey and record of rights.

1. Dompárá	...	49	84·83
2. Aul	...	24	80·60
3. Harichpur	...	83	62·09
4. Bisunpur	...	82	17·51
5. Chedrá	...	28	3·37

Both these estates in my opinion are outside our operations, and may be well omitted from survey and settlement. The area of these two estates is chiefly taken up by hills covered by jungle, and the area under cultivation is said to be very small. Moreover, I am given to understand that the area under cultivation varies every year, few, if any, of the fields being under cultivation more than three years. It is hardly worth while in a case of this kind to make a cadastral survey and a record of rights which will not be useful for more than three years.

Sukindá	...	1	338·66
Kalkalá	...	40	17·60

Patia, No. 51 in the map, comes within our stride, and survey and settlement should be made of this estate.

APPENDIX S.

Puri.

There are six permanent-settled estates in Puri, and every one of these may be said to fall within the limits of the temporary-settled area. As a matter of fact, two of these estates* (1) Andhari (2) Manikpatna, have already been cadastrally surveyed, and the records are now lying in the Survey Office. They were surveyed prior to my

	No. in map			Area in square miles.
* Andhari	6	...	...	12·43
Manikpatna	2	...	...	21·19
	Total		...	38·62

arrival under a mistaken impression that both the permanent-settled as well as the temporary-settled area had to be surveyed.

Now that the records are ready, it would be a waste of money not to utilize them, and in these two estates, at any rate, I take it a record of rights will have to be made.

	Area in square miles.
1. Malood (1)	16·89
2. Bajrakali (3)	18·50
3. Parikood (4)	69·94
4. Marichpur (5)	53·10
Total ...	158·40
Plus area of Andhari and Manikpatna	33·62
Total of permanent-settled estates	192·02

If these two estates are deducted, we have four small estates, the total area of which does not exceed 158·40 square miles. These, in my opinion, fall within His Honor's definition as being mixed in with the temporary-settled area, and should be taken in our stride.

B. C. MITRA,

For Settlement Officer, Orissa Division.

APPENDIX Z.

Balasore.

There are 11 permanent-settled estates in Balasore. Of these, two, viz. (1) Bhograi and (2) Fatihabad, are, it will be seen, not mixed in with the temporary-settled area. With regard to the eight remaining estates, the names of which are given below, the lands of these estates, I am given to understand, are interlaced with the lands of other temporary-settled villages, and must therefore be surveyed:—

Names of estates.	No. in the map.	Area in square miles.
(1) Bhograi ...	5	48·73
(2) Fatihabad ...	1	61·89
Total		110·62

Names of estates.	Number in the map.	Area in square miles.
1. Nangalsur		14·72
2. Sahabunder		10·97
3. Bhelore Chour		40·00
4. Napoo Chour		35·31
5. Chuck Ismailpur (portion) ...		3·26
6. Birkool (portion)		8·83
7. Kankrá Chour (portion) ...		11·00
8. Mirgodá (portion)		2·77
Total ...		126·86
Plus Kanika		177·62
Grand Total ...		304·48

B. C. MITRA,

For Settlement Officer, Orissa Division.

Consolidated statement for the three districts of the Orissa Division.

District.	Nature of estate.	Area.	Previously surveyed.	Surveyed in 1878.	Area of new survey, 30th September 1891.	Total of columns 4, 5, and 6.	Area to be surveyed.	Traversed up to 30th September 1891.	Area demarcated up to 30th September 1891.	Balance column 8—(column 9 + column 10).	Area eliminated.	Area remaining to be demarcated.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Cuttack ...	Permanently settled ...	1,483	623	19	66	708	775	...	40	735	356	379	
	Temporarily ,, ...	3,094	999	344	257	1,600	1,494	282	386	826	...	826	
Puri ...	Permanently ,, ...	192	...	...	36	36	156	...	...	156	...	156	
	Temporarily ,, ...	2,304	972	...	689	1,661	643	165	143	335	...	335	
Balasore...	Permanently ,, ...	411	177	...	...	177	234	...	...	234	...	234	
	Temporarily ...	1,823	...	...	...	...	1,823	...	283	1,540	...	1,540	
	Total ...	9,307	2,771	363	1,048	4,182	5,125	447	852	3,826	356	3,470	

B. C. MITRA,

For Settlement Officer.

District.	Name of pargana.	Area in square miles according to previous survey.	Number of mauza according to present survey.	Number of mauzas of which khanapuri has been done.		Remarks.
				To 30th September.	Area in square miles.	
Cuttack ...	P. S. Durpun ...	100·91	219	204	48·06	
	,, Mendhupur ...	60·58	52	52	10·17	
	T. Bardiala ...	6·81	16	16	7·03	
	,, Benahar ...	47·16	47	39	20·00	
	,, Deogan ...	50·93	142	90	60,00	
	,, Erruckpur ...	4·79	12	12	3·08	
	,, Gundito ...	14 91	7	4	4 00	
	,, Kanchi Khund ...	4 65	14	14	4·67	
	,, Katay ...	68·35	135	68	53·00	
	,, Kernalkhund ...	9·61	25	25	10·01	
	,, Kokakhund ...	29·27	77	76	29·21	
	,, Kounia ...	7·57	10	8	5·88	
	,, Kohomda Joypur ...	21·48	13	12	3·35	
	,, Olos ...	41 57	9	9	5·69	
	,, Saibur ...	33·56	61	61	35·59	
	,, Ulti ...	79·19	25	25	8·69	
	,, Dalijona ...	79·64	9	8	4·79	
	Total ...	660·98	873	723	313·22	
Puri ...	P. S. Andari ...	12·43	18	18	13·60	
	,, Manikpatna ...	21·19	12	12	22·77	
	,, Choubiskood ...	105·46	180	180	99·50	
	,, Kodhar ...	27·19	45	45	27·96	
	,, Kotrang ...	55·83	225	225	56·73	
	,, Kotdesh ...	181·55	292	292	155·64	
	,, Lembai ...	89·97	217	217	87·44	
	,, Oldhar ...	41·14	42	42	57 33	
	,, Rahang ...	149·49	245	245	148·35	
	,, Serai ...	67·35	104	104	67·35	
	Total ...	751·60	1,380	1,380	736·67	

B. C. Mitra,

For Settlement Officer.

Statement showing the Estates under Survey and Settlement of Revenue during the half-year ending 30th September 1891.

A.

Division.	District.	Number of parganas.	Total number of villages under survey and settlement.	Estimated area in square miles.		Whether surveyed by professional or non-professional agency.	Area surveyed—						Number of villages of which the records have been handed over by Survey to Settlement Department.		Total cost.						Rate per acre.		Increase of revenue.		Remarks.
							Up to 31st March 1891.		During the half-year under report.		Total.				31st March 1891.		During the half-year.		Total.						
				Permanently-settled estates.	Temporarily-settled estates.		Traverse.	Cadastral.	Traverse.	Cadastral.	Traverse.	Cadastral.	Up to 31st March 1891.	During the half-year under report.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Actually obtained.	Expected.	
1	2	3	4	5	6	7	8		9		10		11		12		13		14		15	16	17	18	19
Orissa	Cuttack ...	78	See note in statement B.	504	2,095	Professional agency.	111	107	171	216	282	323	30	317	Rs. 28,142	Rs. 2,193	*Rs. 93,354	Rs. 17,011	Rs. 2,19,031	Rs. 19,204	Rs. A. P. ...	Rs. A. P. ...	Settlement work not started.	Ditto ditto.	
				Elliminated, *vide* paragraph 9 of report ... 356	Previously surveyed 999																				
				Previously surveyed ... 623	Total 3,094																				
				Total ... 1,483																					
	Puri ...	25		192	1,332		46	529	119	196	165	725	530	424	97,535	2,192		24,092		26,284	...	...			
					Previously surveyed 972																				
					Total 2,304																				
	Balasore ...	75		234	1,823		Survey not started in Balasore.				...		...	...	...	...	...	110	...	110	...	...			
				Previously surveyed... 177																					
				Total ... 411																					
		187		930	5,250		157	686	290	412	447	1,048*	560	741	1,25,677†	4,385	93,354	41,213	2,19,031†	45,598	0 2 4	0 0 5			

Of this it is not stated how much was surveyed before September 1890, and how much between 1st October 1890 and 30th September 1891.

† This is apparently the tota expenditure on 1,048 miles, but how much was spent in the year,—1st October 1890 to 31st September 1891, is not given, but ought to have been.

M. F.

Statement showing the progress made in Government Estates and temporarily-settled Tracts in Record of Rights and Settlement of rents up to 30th of September 1891.

B.

Division.	Districts.	Name of circle.	Total number of villages.	Total number of villages surveyed.	Number of villages in which Record of Rights has been completed.		Total numbers of raiyats in the villages in column 4.	Number of raiyats whose rents had been recorded and status determined.			Attestation.				Total rental of tenants whose rents have been settled.				Number of villages of which the records have been received from the Survey Department.	Number of raiyats in column 19.	Remarks.
					Up to 31st March 1891.	During the half-year under report.		Up to 31st March 1891.	During the half-year under report.	Total of columns 9 and 10.	Number of plots.	Number attested up to 31st March 1891.	Attested during the half-year.		According to new settlement.	According to previous jamabandi.	Increase.	Decrease.			
													Number of plots.	Area in acres.							
1	2	3	4	5	6	7	8	9	10–	11	12	13	14		15	16	17	18	19	20	
Orissa.	Cuttack...	Tangi ...	This information cannot be supplied for either the district or circles until all the parganas have been surveyed. I find that the number of revenue survey mauzas do not agree with that found in the present survey, the tendency is invariably towards an increase in number.	863	...	63	See remark in column 4.	...	1,604	1,604	67,760	...	9,998	4,973	...	Rs. A. P. 2,481 0 0	...	...	(a)254	11,562	
		...		...	...	6		...	638	638	10,568	...	3,244	1,123	...	...	...	...	(a)32	2,009	
				863	...	69		...	2,242	2,242	78,328	...	13,242	6,096	...	2,481 0 0	...	...	(a)286	13,571	
	Puri ...	Rahang		...	36	48		2,092	6,295	8,387	196,113	3,524	32,044	17,969	...	12,122 0 0	...	...	239	34,575	
		Karmala		...	...	194		...	17,767	17,767	148,668	...	85,388	58,602	...	43,283 0 0	...	...	285	25,315	
		Piplee ...		...	...	...		...	...	...	...	...	...	...	...	...	...	...	26	2,148	
		Lembai and Kotrang.		1,380	...	...		...	794	794	127,544	...	3,844	1,085	...	1,398 0 0	...	...	324	25,564	
	Balasore ...	...	No survey has yet been commenced.	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	
				1,380	36	242		2,092	24,856	26,943	467,325	3,524	121,276	77,656	...	56,803 0 0	...	...	874	87,602	
			Grand Total ...	2,243	36	311		2,092	27,098	29,190	545,653	3,524	134,518	83,752	...	59,284 0 0	...	...	1,160	101,173	

(a) In statement "A," columns 10 and 11, the survey shows 347 village records made over to this department. This difference is due to the survey, including all records despatched by them up to the 30th September 189 But the settlement do not receive the last batch till the month fallen, hence the difference.

APPENDIX E.

Extract from Annual Report of Survey Operations. Season 1890-91.

No. 8 Party (Orissa), Survey of India.

30. *Detail Survey.*—The cadastral survey was commenced in the High Level Canal tract, n which an area of 119 square miles had been traversed in advance during the past season, and was carried on in the parganas noted in the following statement:—

Names of Parganas.	Number of villages.	Number of fields.	Number of "kittas."	Area in acres.	Area in square miles.
Kokuakhand... ...	77	48,643	138,200	18,694·40	29·21
Khirwalkhand ...	25	17,840	53,367	6,406·40	10·01
Kanchikhand... ...	14	5,844	18,010	2,988·80	4·67
Chowsatpara	9	10,855	28,721	3,641·60	5·69
Dalijora	9	3,919	11,075	3,052·80	4·77
Kundai Jaipur ...	13	8,253	19,384	2,144·00	3·35
Arakhpur	12	6,919	14,753	1,971·20	3·08
Alti	25	16,843	42,844	5,561·60	8·69
Killa Darpan ...	209	63,427	181,867	32,038·40	50·06
Killa Madhupur ...	52	13,473	44,815	6,508·80	10·17
Total ...	445	195,816	553,036	83,008·00	129·70

On the completion of the above parganas, the camp was obliged to be moved south to Jagatsinghpur, as no more traverse work near the locality was ready; this necessarily caused some delay.

Detail survey operations were continued in the parganas mentioned in the following statement:—

Names of Parganas.	Number of villages.	Number of fields.	Number of "kittas."	Area in acres.	Area in square miles.
Saibir	61	65,998	131,996	21,497·60	33·59
Deogan	142	90,956	181,912	40,288·00	62·95
Bardiala	16	9,728	24,320	4,499·20	7 03
Gandito	7	3,983	7,966	2,828·80	4·42
Kurnia	10	4,758	11,895	3,763·20	5·88
Katay	135	77,969	194,922	36,211·20	56·58
Benahar	47	36,483	109,449	13,491·20	21·08
Total ...	418	289,875	662,460	122,579·20	191·53

11. *Cadastral area surveyed.*—The cadastral survey on the scale of 16 inches to a mile was carried on in the parganas mentioned in the following table, which also shows in detail the number of villages, fields, "kittas," and area of each pargana:—

Names of Parganas.	Number of villages.	Number of fields.	Number of "kittas."	Area in acres.	Area in square miles.
Limbai	235	157,127	226,075	57,242·30	89·44
Kotrahang	213	117,345	165,164	36,307·94	56·73
Kodhar	45	46,088	92,902	17,895·86	27·96
Andhari	8	2,559	6,489	9,519·69	14·87
Manikpatna	12	5,903	13,632	15,215·93	23·78
Oldhar (portion) ...	13	6,430	13,527	2,937·45	4·59
Tappa Kalajuri ...	17	21,775	38,230	6,032·90	9·43
Kotdesh (portion) ...	275	310,260	464,965	89,101·83	139·22
Total ...	818	667,487	1,020,984	234,253·90	366·02

APPENDIX F.

No. 1223GS, dated Chittagong, the 30th October 1891.

From—F A. Slack, Esq., Settlement Officer, Chittagong,

To—The Commissioner of the Chittagong Division.

I have the honour to submit herewith the half-yearly statements A and B, called for by the Government of Bengal in their letter No. 455T—R, of the 24th ultimo, and to make the following report. The statements sent relate to the half-year ending the 30th ultimo.

2. Separate statements have been given for Old Thána Ramoo, since that settlement has always been treated apart in an office point of view from that of the Sadar subdivision.

3. Besides forms A and B, I have prepared and now submit a third form (C), which shows for the various areas which have been brought under the Tenancy Act the work done or to be done, that relating to the Government estates being shown (so far as the work done is concerned) apart from that concerning private estates. This form shows for Ramoo the result in those villages where the assessment has been finished and the estimated result for the whole area.

4. *Information as to the work done by the Settlement Officer and his assistants, showing the distribution of work to each officer, his head-quarters, and the number of days he was absent on tour.*

(*a*) During the period under review, I was Settlement Officer till the recess began, viz., till the 11th of July, when I was relieved by Mr. Allen on my being appointed to officiate as District and Sessions Judge of this district. The Settlement Officer spent his time from the 1st of April till the recess mainly in looking after the khanapuri, which was under his direct supervision, and on which about 120 amíns a month were engaged. In addition to this the Settlement Officer visited and inspected in the same time his assistants Mr. Allen and Babu Durga Charan Ghose, and also supervised the work of the Khasra office, where the records, viz., the khatian and various other authorized forms, are written up. This office is at head-quarters and employs a large number of amla, at present on the average about 187. The head-quarters of the Settlement Officer and his assistants are at Chittagong, and during the half-year the Settlement Officer was out on tour 65 days.

(*b*) Babu Jogendra Kumar Bose was the Assistant Settlement Officer in charge of Old Thána Ramoo throughout the year under report, and was engaged in completing the attestation, deciding disputes, and preparing the necessary figures for fair-rent decisions. He spent 183 days out in camp. During the half-year he attested 14,776 plots, thereby completing the work, disposed of 348 original civil suits, and 285 miscellaneous cases. Against his decrees 29 appeals were preferred, and so far as is at present known three were remanded, six were dismissed, and one was decreed. Besides this, he submitted two fair-rent proposition statements.

(*c*) Mr. C. G. H. Allen, Covenanted Deputy Collector, was the Assistant Settlement Officer in charge of the Jaldi or South Banskhali and the Anwara and Parke circles in the Sadar subdivision (mujmillis showing the various villages in each Assistant Settlement Officer's circle of the Sadar subdivision, and other particulars will be sent hereafter, but the Survey Office is unable to supply me with them in time for this report). These two circles comprise an area of 81·8 square miles, of which the attestation for 31 square miles comprised in 15 villages was done during the period under report. In addition to this Mr. Allen disposed of 245 cases, of which three were appealed against to the Special Judge, whose orders have not yet reached me. Mr. Allen, after finishing his survey course, spent on actual settlement duty two months and 17 days in camp, viz., from the 23rd of April to the 9th of July. I also occasionally utilized Mr. Allen in inspecting the khanapuri work of certain amíns who were employed in his circle.

(*d*) Babu Durga Charan Ghose was in charge throughout the half-year of the Belgaon circle in the Sadar subdivision, which comprises part of the Banskhali thána, and in area amounts to 70 square miles. During the half-year this officer was out on tour 3 months and 12 days (from April 1st to July the 12th), and besides disposing of 1,308 cases did the attestation of 50,103 plots, covering an area of 22·3 square miles in 26 villages. The attestation in this circle, which remains to be done after the close of the half-year, amounts to 92,687 plots. This officer on his return to head-quarters in July was transferred to the General Department temporarily, but managed, while carrying on his ordinary magisterial duties, to watch over his settlement establishment, who were engaged in bringing the records up to date in accordance with the changes noted at attestation time and in collecting the various figures needed for the fair-rent proposition statements.

(*e*) Babu Romesh Chunder Dass was throughout the half-year in charge of the Satkania circle, which comprises an area of 271·7 square miles included in 318,610 plots or khasra numbers, of which 57,626, including 40,482 done during the half-year under report, have been attested. This circle is too large for one officer, and as soon as the additional assistants who have been applied for arrive, it will be divided into two. Babu Romesh Chundra Dass was practically wholly employed during the half-year on doing attestation. He also submitted fair-rent proposition statements for 18 villages, and disposed of 469 cases during this time, of which seven were appealed to the Special Judge with the result that one was remanded, one decreed, two confirmed, and three have not yet been disposed of. This officer was out in camp three months and 12 days between the 1st of April and 16th of July 1891, after which he came into head-quarters and acted during the recess as Personal

Assistant to the Settlement Officer (Mr. Allen, who was then engaged on criminal work in addition to his own duties), besides looking after his own establishment, who were engaged on work similar to that noted above with regard to Babu Durga Charan Ghose.

5. *Progress of*—

(*a*) *Demarcation.*—The demarcation of all the cultivated tracts both in the Sadar subdivision and Old Thána Ramoo was completed before the 1st of April last. The jungle and hill portion in Old Thána Ramoo had been partitioned before the commencement of the present year among the various mauzas, so that now no land exists there which is not included in some mauza. In the Sadar subdivision the apportionment of the hill and jungle tracts among the various villages bordering such tracts cannot be completed till the topographical maps of such tracts are ready. Owing to certain errors in survey, this work could not be done during the past recess for thánas Patia, Banskhali, and Satkania, but I trust to be able to finish it before the year closes.

(*b*) *Survey.*—The survey of Old Thána Ramoo was completed before the beginning of this year.

In the Sadar subdivision there is an area of 1,626 square miles, of which 1,262 is estimated to require cadastral and 364 topographical survey. Of this the department had surveyed cadastrally 589 square miles up to the 31st of March last, since when up to the 30th September 139 square miles cadastral and 112 square miles topographical have been done. The topographical work, as already pointed out, will require revision. Some delay was caused in the khanapuri work by the errors found to exist in the survey of many of the basti sites in villages. The Survey Department has, therefore, in the coming season, to complete the cadastral survey of 534 square miles, the topographical work of 252 square miles, the revision of 112 square miles of topographical, and in addition the traverse of (i) the main circuit along the south bank of the Fenny river and the sea coast down to the town of Chittagong, (ii) some 15 miles of the Fatickcherry thána boundary, (iii) a few villages near the town of Chittagong, and (iv) a portion of the boundary of the proposed Sitakhund forest reserve. These various items of work will, I am told, be completed by the commencement of the rains of 1892. The work originally was expected to be finished by the end of the current official year, but owing to the unexpected increase in the cadastral area, longer time will be required. Turning to thánas it may be pointed out that the cadastral work has practically been finished in thánas Banskhali and Satkania, in thána Patia, save with regard to two villages, while portions of thána Raojan and Hathazari have been completed. I have arranged with the Deputy Superintendent in charge to begin cadastral work in each and all of the uncompleted thánas directly the season commences, so that as the various circles to the south are completed by the assistants, work may be found ready for them in the northern circles.

(*c*) *Receipt of records.*—The records of Old Thána Ramoo had all been received before the year began. Up to the 1st of January the work of preparing the records required for attestation in the Sadar subdivision was entrusted to the Survey Department, but after that date it was made over to me, the Survey Department merely having to—

(*a*) supply maps for the khanapuri amíns to fill in and write up the khasras;
(*b*) furnish the areas of all plots;
(*c*) ink up maps the khanapuri of which had been completed, and
(*d*) supply traces of such maps.

Up to the 31st of March last the records of 79 villages (of which 50 had been done by the Survey Office) containing an area of 51·3 square miles nearly had been done, and since then up to the close of the half-year the records of 169 more villages, comprising an area of 170·4 square miles nearly, have been got ready for attestation work.

(*d*) *Khanapuri.*—This work, as regards Old Thána Ramoo, had been finished before the year began. As regards the Sadar subdivision it had, up to the 1st of January last, been done by the Survey Department, but from that date it was made over to me. Owing to various reasons, the khanapuri which had been done by the Survey Department had all to be revised, and in addition to that fresh villages were taken up during the period under report, so that by the close of the half-year 798,121* plots had been done, of which 260,279 were completed since the 1st of March last. The staff employed was on the average 120 amíns per mensem, which enabled me just not to exceed my supply of maps from the Survey Office. Taking the amíns as a body, each man did only 31 plots a day. This rate of progress is not rapid, but looking at the material available and the complexity of the tenures, I am unable to hold out hopes of its being much exceeded. To enable me to obtain an increase in the staff, I used to hold periodical examinations of candidates for amínships, and in that way have managed to create a supply, which will, I think, enable me this season to increase my number to close on 200.

(*e*) *Fixation of rent, whether determination of existing rents or decision of fair rent.*—As regards the villages in the Sadar subdivision, no fair-rent decisions have yet been passed. For 18 villages in thána Satkania fair-rent proposition statements have been prepared. The method of procedure hitherto observed was as follows:—The existing rents were recorded, great care being taken to see that what was recorded was correct. When this had been done, then for each taluk a table was made showing the lands divided into cultivated and waste which each tenant held, and the rent he paid. So far as the meagre data at my disposal go, it

* This does not agree with the number given in the Annual Report 477,682 + 306,463 = 774·145.

would appear that owing to the rise in prices Government is entitled to a rise of 62 per cent., so that (omitting fractions) in the case of a taluk whose present Government rent is Rs. 15, Government should now get Rs. 25, and the gross assets, upon which the talukdar is to be allowed 30 per cent., should be Rs. 35. In the case of taluks whose lands had all been sublet, if the existing rentals yielded a sum which, after deducting the 30 per cent., gave a net rental for the taluk which came appreciably near the 62 per cent. increase, then the existing rents were left untouched save in those cases where it was clear that a tenant was holding his lands at an unfair rent. In this way advantage could be taken of the efforts which the talukdars had made to increase their rentals, and an increase, so far as I have seen, a large one, to the Government revenue was secured without in any way creating opposition from the bulk of the cultivators. With regard to a taluk whose existing rentals were not considered fair, or whose lands, were all, or mostly all cultivated by the talukdar himself, the rents were assessed at rates the propriety of which was discussed in the fair-rent decision, and which were based on recorded evidence.

Under instructions lately given me by His Honour the Lieutenant-Governor of Bengal, the method above sketched out will not be followed out in all its details, but a report will be submitted dealing with certain areas and submitting proposals for their assessment by soil rates. In Old Thána Ramoo, where for most of the villages the fair-rent decisions have been passed, a report on similar lines will be submitted as soon as possible, so that it may be considered whether the steps which have been taken should be modified or confirmed.

(*f*) *Assessment of land revenue.*—Noabad taluks being tenures, the sum payable to Government by a noabad talukdar is fixed by the Settlement Officer acting under the Tenancy Act. There is only one temporarily-settled estate in the district, viz., noabad Taraf Joy Narayan Ghosal, but the assessment of this estate cannot be taken up until all the thánas have been attested, since the lands comprising the estate are scattered over very many villages in each thána. The gross assets upon which the assessment will eventually be made will, however, be determined in the same way as in the case of a noabad taluk.

6. *Training and utilization of patwáris, kánungos, and other local officials.*—There are no local officials here, but the care which is being taken now in training up amíns from among the residents of this district will suffice to provide a supply from which to choose men to fill the posts of the patwáris, who, I understand, will eventually be appointed.

Statement showing the Estates under Survey and Settlement of Revenue during the half-year ending 30th September 1891.

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed.			Number of villages of which records have been prepared by the Settlement Officer.		Total cost up to—						Rate per acre.		Increase of Revenue.		Remarks.
						Up to 31st March 1891.	During the half-year under report.	Total area surveyed.	Up to 31st March 1891.	During the half-year under report.	31st March 1891.		During the half-year under report.		Total.		Survey.	Settlement.	Actually obtained.	Expected.	
											Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
						Sq. M.		Sq. M.			Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P. (a)	Rs. A. P. (a)		Rs.	
Sadar subdivision of Chittagong.	Chittagong.	Inapplicable to this settlement owing to the vast number of estates comprised in this area.	933	1,626 square miles or 1,040,640 acres. This includes both Government and permanently-settled estates, the area of the latter cannot be accurately stated till the survey and settlement is done.	Professional agency.	589	251 square miles including 112 square miles of jungle and hills.	840	79 This number includes 50 villages of which the records were prepared by the Survey Office and made over to the Settlement Officer.	169	1,55,324 0 11	43,444 14 4	69,817 13 3	37,658 0 10	2,25,141 14 2	81,102 15 2	0 3 3	0 1 2·7	Fair-rent decisions have not yet been prepared.	1,20,000	(a) These figures are calculated with regard to the whole area of the Sadar subdivision. Since to throw the total expenditure merely on the area surveyed) or the area for which records have been prepared could tend to induce an erroneous impression since no account would then be taken of the work done on incomplete villages.

N.B.—

		Acres
1,262	square miles cultivation	= 807,680
364	„ jungle and hills	= 232,960
1,626		= 1,040,640

The figures showing area and cost do not agree with those supplied by Mr. Grant, the Deputy Superintendent in charge of the Survey Party. The Settlement Officer has been requested to explain them.

M. F.

F. A. SLACK,
Settlement Officer.

Statement showing progress made in Government Estates and temporarily-settled tracts in Record of Rights and Settlement of rents up to 30th September 1891.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which records of rights have been completed.		Total number of raiyats (tenants of all kinds) in the villages in column 4.	Number of raiyats (tenants of all kinds) whose rents have been recorded and status determined.			Total rental of tenants (holding directly under Government) whose rents have been settled.				Remarks.
				Up to 31st March 1891.	During the half-year under report.		Up to 31st March 1891.	During the half-year under report.	Total of columns 8 and 9.	According to new settlement.	According to previous settlement.	Increase.	Decrease.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Sadar subdivision of Chittagong.	Chittagong ...	Inapplicable to this settlement owing to the vast number of estates comprised in the area.	579 This includes only thanas Patia, Banskhali, Satkania and Raojan. The only areas to which the Tenancy Act has yet been extended.	(a)		Of the villages in which attestation has been actually begun ... 36,979 Approximate number in villages in which attestation has not begun ... ... 381,600 Total ... 418,579	7,868	29,111	36,979 Government tracts ... 17,501 Permanently-settled tracts 19,478 36,979	(b)	(b)	(b)	(b)	(a) No records of rights has been completed and finally published during the period under report. The attestation has been completed with regard to 104 villages. (b) The proposition statement of the settlement of fair rent of 18 villages of the Satkania circle have been approved, but as they were sent late to the concerning office, no settlement of fair rent could be completed. Owing to recent orders these fair-rent proposition statements will be revised.

NOTE.—According to the details of this statement given on the next page, the figures in columns 8 and 9 should be 7,879 and 29,100 respectively.

M. F.

F. A. SLACK,
Settlement Officer.

1	2	3		4	5		6	7	8	9	10		11	12	13
Name of thána and Circle.	Total number of villages under survey and settlement.	Area.		Total number of villages attested.	Area.		Number of nonbad tenants of the attested villages.	Tenants under permanently-settled estates.	Total of columns 6 and 7.	Number of unattested villages.	Area.		Approximate number of tenants of the unattested villages.	Total of columns 8 and 11.	Remarks.
		Acres.	Square miles.		Acres.	Square miles.					Acres.	Square miles.			
Banskhali	38	232,320	360	31st March 14 30th September ... 12	12,873	...	1,293 10,154	1,657 2,264	15,368	12	...	...	...	...	Number of tenants whose khatians have been attested up to the 31st March 1891— Government tract ... 3,074 Permanently-settled tract 4,805 7,879 And since then up to the 30th September 1891— Government tract ... 14,427 Permanently-settled tract 14,673 Total ... 29,100 Grand Total ... 36,979
							11,447	3,921							
Jaldi	14			30th September ... 8	17,344	...	928	1,404	2,332	6	...	...	...	...	
Satkania	109			31st March 41 30th September ... 22	29,303	...	1,781 2,506	3,148 9,405	16,840	46	...	...	...	...	
							4,287	12,553							
Total ...	161	232,320	360	97	59,520	93	16,662	17,878	34,540	64	1,72,800	270	129,600	164,140	
Outpost Anwara and Banke of Banskhali thána ...	74	184,320	288	30th September 7	2,560	4	847	1,592	2,439	297	1,81,760	284	136,320	138,759	
Patiya	230			.....	...	...	...	...	...	...	...	...	...	...	
	304														
Raojan and outpost Rangonia of that thána	114	154,240	241	.....	...	...	...	...	...	114	1,54,240	241	115,680	115,680	
Grand Total ...	579	570,880	889	104	62,080	97	17,509	19,470	36,979	475	5,08,800	795	381,600	418,579	

F. A. SLACK,

Settlement Officer.

Statement showing the estates under Survey and Settlement of Revenue during the half-year ending 30th September 1891—(Ramoo).

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional agency.	Area surveyed.			Number of villages of which the records have been handed over by the Survey Office to the Settlement Office.		Total cost up to—						Rate per acre.		Increase of Revenue.		Total of columns 20 and 21.	Remarks.
						Up to 31st March 1891.	During the half-year under report.	Total area surveyed.	Up to 31st March 1891.	During the half-year under report.	31st March 1891.		During the half-year under report.		Total.		Survey.	Settlement.	Actually obtained.	Expected.		
											Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Chittagong	Chittagong	Old thána Ramoo.	50	156,390·40	Professio n a l agency.	156,390·40	...	156,390·40	50	...	Rs. A. P. 67,706 5 5	Rs. A. P. 11,974 15 3	Nil ...	Rs. A. P. 4,820 10 6	Rs. A. P. 67,706 5 5	Rs. A. P. 16,795 9 9	Rs. A. P. 0 6 11	Rs. A. P. 0 1 8	Rs. A. P. 1,107 0 0	Rs. 35,362	Rs. 36,469	

F. A. SLACK,

Settlement Officer.

Statement showing progress made in Government Estates and temporarily-settled tracts in Record of Rights and Settlement of rents up to 30th September 1891—(Ramoo).

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which records of rights have been completed.		Total number of ryots (tenants) of all kinds in the villages in column 4.	Number of raiyats (tenants of all kinds) whose rents have been recorded and status determined.			Total rentals of tenants paying direct to Government whose rents have been settled.				Remarks.
							Up to 31st March 1891.	During the half-year under report.	Total of columns 8 and 9.	According to new settlements.	According to previous jamabandi.	Increase.	Decrease.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Chittagong	Chittagong	Old Thána Ramoo ...	50	12	...	26,341	22,477 viz.— Government estate 10,689 Private estates 11,788	3,864 viz.— Government estate 778 Private estates 3,086	26,341 viz.— Government estate 11,467 Private estates 14,874	Rs. 90,126	Rs. 53,657	Rs. 36,469	Rs. ...	

F. A. SLACK,

Settlement Officer.

Ramoo.

1	2	3		4	5		6	7	8	9	10		11	12	13
Name of Thána and Circle.	Total number of villages under survey and settlement.	Area.		Total number of villages attested.	Area.		Number of noabad tenants of the attested villages.	Tenants under permanently-settled estates.	Total of columns 6 and 7.	Number of unattested villages.	Area.		Approximate number of tenants of the unattested villages.	Total of columns 8 and 11.	Remarks.
		Area in acres.	Square miles.		Acres.	Square miles.					Acres.	Square miles.			
							31st March 1891 10,689 30th September 1891 778								
Old thána Ramoo.	50	156,390·40	244	50	1,56,390·40	244	11,467	14,874	26,341	Nil ...	...	...	...	...	...

F. A. SLACK,
Settlement Officer.

APPENDIX G.

No. $\frac{1170\ C.\ C.}{II-24}$, dated Chittagong, the 21st November 1891.

Memo. by—W. OLDHAM, Esq., Officiating Commissioner, Chittagong Division,

FORWARDED to the Director of Lands Records in continuation of this office No. $\frac{1083\ C.\ C.}{II-2}$, dated 3rd November 1891.

No. 1310Gs., dated Chittagong, the 19th November 1891.

From—F. A. SLACK, Esq., Settlement Officer, Chittagong,
To—The Commissioner of the Chittagong Division.

WITH reference to your memorandum No. $\frac{693\ G.\ C.}{VIII-18}$ of the 6th instant, I have the honour to submit herewith my yearly report for the year ending the 30th of September 1891, and beg to state that it was not sent in earlier because I was under the impression that only a half-yearly report was required from Settlement Officers by the Government letter No. 455TR of the 24th of September last.

2. Statements in Form A and B, showing the work done during the year under report in the Government, private, and temporarily-settled estates in the Sadar subdivision and old Thána Ramoo of this district, are appended, separate statements being given for each of the two tracts, since they have always been treated apart from one another.

3. I have not given a statement showing the results of assessment of land revenue, because this has not yet been settled for the noabad talukdars either in the Sadar subdivision or old Thána Ramoo. In old Thána Ramoo the fair rents payable by the tenants under the talukdars have been fixed with regard to 43 villages, but the gross assets upon which depends the assessment of land revenue of each taluk will have to be revised in accordance with the orders lately issued regarding the preparation of soil maps. In the Sadar subdivision no fair rent decisions have as yet been passed.

4. *Information as to the work done by the Settlements Officer and his assistants, showing the distribution of work to each officer, his head-quarters, and the number of days he was absent on tour.*

(*a*) *Settlement Officer.*—The head-quarters of the Settlement Officer and his assistants are at Chittagong. I was in charge of the office until the 11th of July, when on being deputed to act as District and Sessions Judge of this district, I was relieved by Mr. C. G. H. Allen, who remained in charge till the end of the year. I was out in camp during the year for 141 days, and Mr. Allen as Settlement Officer for 4 days.

My time was employed in looking after the staff of khanapuri amíns, in inspecting the offices of the assistants, and supervising the work of the khasra office, where the khatian and various other authorized forms are written up.

(*b*) In old Thána Ramoo, a tract containing nearly 245 square miles, the work was in charge of Babu Durga Charan Ghose up to the 4th of November, when he was relieved by Babu Jogendra Kumar Bose, who remained in charge up to the end of the year. The number of days spent in camp during the year by the officer in charge of this tract was 332.

The work performed by this officer consisted in completing the attestation (which was finished in May last), in deciding disputes, and preparing the necessary figures for fair rent decisions. Within the period under report the following work was done:—

(i) The entries regarding the lands held by 15,389 tenants were attested;
(ii) Five hundred and fifty-eight original suits and 1,062 miscellaneous suits were disposed of, and
(iii) Eight fair rent decisions were passed.

(*c*) In the Sadar subdivision Mr. C. G. H. Allen, Covenanted Deputy Collector, joined as an Assistant Settlement Officer on the 2nd of March 1891. Up to the 23rd of April Mr. Allen was engaged in learning survey work, and from that date till the 11th of July he was employed on settlement duty. Between the two dates last mentioned Mr. Allen spent 2 months and 17 days in camp, and was in charge of South Banskhali and Anwara Parki circles. These circles comprise an area of 81·8 square miles, of which the attestation relating to 15 villages, comprising an area of 31 square miles, was done during the year by Mr. Allen, who also disposed of 245 cases, and occasionally helped me in inspecting khanapuri amins working near his camp.

From the 11th of July to the close of the year Mr. Allen acted as Settlement Officer, and besides supervising the work of the khasra office, also aided in the general administration of the district by disposing of such criminal cases as were made over to him.

(*d*) Mr. Atul Krishna Raye joined as an Assistant Settlement Officer on the 31st of January last, but after doing a month's attestation work in the Belgaon circle, he fell ill and left. His place was filled up on the 1st of April by Babu Durga Charan Ghose, who was deputed to act as an Assistant Settlement Officer. The circle above named covers an area of 70 square miles, and Babu Durga Charan Ghose, besides disposing of 1,308 cases, did the attestation of 22·3 square miles in 26 villages up to the 12th of July, when the Babu returned to head-quarters. Three months and 12 days were spent by him in camp. On the 12th of July, Babu Durga Charan Ghose reverted to general duty, but managed, in addition to his own work, to supervise his settlement establishment, who were engaged in correcting the records in accordance with the orders passed at attestation time, and in collecting the various figures needed for the preparation of fair rent decisions.

(*e*) Babu Rames Chandra Das arrived at Chittagong on the 24th of January last, since when he has been in charge as Assistant Settlement Officer of the Satkania circle, a tract covering an area of 271* square miles. During this period he has been in camp 165 days, and has attested in that period 54,487 plots, besides disposing of a large number of cases.

* This area is subject to correction owing to an error in the survey figures.

On the 16th of July this officer returned to head-quarters, and from that date till the end of the year he acted as the Settlement Officer's (Mr. Allen's) Personal Assistant.

5. *Progress of—*

(*a*) *Demarcation*—The demarcation of old Thana Ramoo had been completed before the year began, while that of the Sadar subdivision, save as regards the hilly portions, which could not conveniently be allotted to the neighbouring villages until their topographical survey had been done, was finished during the year under report. I hope to be able to portion out the hilly tracts in thánas Patia, Banskhali, Satkania, before the present official year ends. The demarcation work actually done during the year comprised the demarcation of 465 villages in thánas Hathazari, Fatikchari, Raojan, Town, Kumira, and Mirkasarai.

(*b*) *Survey.*—The survey of old Thána Ramoo was completed before the beginning of the year. In the Sadar subdivision there is an area of 1,626 square miles, of which 1,262 is estimated to require cadastral and 364 topographical survey. Up to the beginning of the year 380 square miles had been cadastrally surveyed, and during the year under report a further area of 348 square miles was done, as well as 112 square miles of topographical work; but the latter will require some revision.

The survey of the village sites, owing partly to the amíns' misconduct, and partly to intricacy, was in several instances full of errors, and so khanapuri was to some extent delayed.

In the coming season the Survey Department has to complete the cadastral survey of 534 square miles, the topographical survey of 252 square miles, the revision of 112 square miles of topographical work, and the traverse of (i) the main circuit along the coast down to the town of Chittagong and the south bank of the Feny river, (ii) some 15 miles of the Fatickchari thána boundary, (iii) a few villages near the town of Chittagong, and (iv) a portion of the boundary of the proposed forest reserve.

These various items of work will, I am told, employ the Department up to the rains of 1892. Originally it was expected that the work would be done by the end of this official year, but owing to the expected increase in the cadastral area, more time will be required. With reference to the thánas, the cadastral work has practically been finished in thánas Banskhali, Satkhania, and Patya, save in 2 villages, while portions of thanas Raojan and Hathazari have been done.

I have arranged with the officer in charge of the survey party that this season cadastral work shall be begun simultaneously in each of the remaining thánas, and that each sheet as it is done shall be sent to me, and not kept till the whole village is finished. In this way I hope to have work ready for assistants when the circles south of the Karnafooli are finished, and also to get the big villages ready more promptly than has hitherto happened.

(*c*) *Receipt of records.*—Up to the 1st of January the work of preparing the records required for attestation in the Sudder subdivision was done by the Survey Department, but after that date it was made over to me, and the Survey Department has now merely (i) to supply maps for the khanapuri amíns to use when preparing the khasra; (ii) to furnish the areas of all plots; (iii) to ink maps the khanapuri of which has been done; and (iv) to supply traces of such maps.

Before the begining of the year, the Survey Department had prepared and handed over the records of 36 villages comprising the area of 15·9 square miles. During the year the records of 212 villages covering an area of 205·8 square miles were prepared and handed over for settlement work Of these 212 villages, the records of 14, covering an area of 35·4 square miles, were prepared by the Survey Department.

(*d*) *Khanapuri.*—During the year under report the khanapuri of 477,682 plots was done, the entries (previously done by the Survey Department) regarding 306,463 plots were revised. The staff employed by me consisted on the average of 120 amíns under about 11 Inspectors. This number enabled me just not to exceed my supply of maps from the Survey Office. Taken as a body, the average daily outturn of each amin came only to 31 plots. I am unable to hold out hopes that this scale will be much increased during coming the season. To enable me to secure supplies of trained men, I used to hold periodical examinations of all candidates for amínships, and in this way have considerably increased the number of available men.

(*e*) *Fixation of rent, whether determination of existing rent or decision of fair rent.*—Under recent orders the method which will be followed in fixing rents will be to take existing rents and check them with the results obtained from the soil maps. As regards old Thána Ramoo, a report will be prepared showing, with regard to the 43 villages for which fair rent decisions have been passed, the results which might have been obtained by using the rates obtainable from the soil maps.

(*f*) *Assessment of land revenue.*—There is only one temporarily settled estate in this district, viz., noabad tarif Joy Narayan Ghosal. With regard to that estate, the gross assets which will form the basis on which to make the assessment of land revenue will, so far as the tenants are concerned, be calculated under the Bengal Tenancy Act.

6. *Training and utilization of patwaris, kanungoes, and other local officers.*—There are no local officials here, but the care which is now being taken to train up amins from among the residents of this district will suffice to provide a supply from which to choose men to fill the posts of the patwaris who I understand will eventually be appointed.

Statement showing the estates under survey and settlement during the year ending 30th of September 1891 in the Sadar Subdivision, District Chittagong.

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether by professional or non-professional agency.	Area surveyed.			Number of villages of which records have been prepared by the Settlement Officer—		Total cost.						Rate per acre.		Increase of revenue—		Remarks.
						Up to 30th September 1890.	During the year under report.	Total area surveyed.	Up to the 30th September 1890.	During the year under report.	Up to 30th September 1890.		During the year under report.		Total.		Survey.	Settlement.	Actually obtained.	Expected.	
											Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Sadar subdivision of Chittagong.	Chittagong.	There are too many estates to be entered here.	933	1,026 square miles or 1,040,640 acres. This includes both Government and permanently-settled estates. The area of the latter cannot be accurately given till the survey and settlement is done.	Professional agency.	Sq. M. 360	Sq. M. 460, including 112 square miles of jungle and hill.	840	36 These were prepared by the Survey Department.	212 Of these, 14 were prepared by the Survey Department.	Rs. A. P. 92,601 14 0	Rs. A. P. 22,210 11 6	Rs. A. P. 1,32,540 0 2	Rs. A. P. 58,992 3 8	Rs. A. P. 2,25,141 14 2	Rs. A. P. 81,202 15 2	A. P. (a) 3 3	A. P. (a) 1 2$\frac{7}{8}$	Fair rent decrees have not yet been passed.	Rs. 1,20,000	

(a) These figures are calculated with regard to the whole area of the Sadar subdivision. Since to throw the total expenditure merely on the area for which records have been prepared would tend to involve an erroneous impression, since no account would then be taken of the work done in incomplete villages.

B.

Statement showing progress made in the Private Estates, Government Estates, and Temporarily-settled Tracts in the Sadar Subdivision of the District of Chittagong with the record of rights and settlement of rents for the year ending the 30th of September 1891.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which records of rights have been completed—		Total number of raiyats (tenants of all kinds) in the villages in column 4.	Number of raiyats (tenants of all kinds) whose rents have been recorded and status determined.			Total rental of tenants (holding directly under Government) whose rents have been settled.				Remarks.
				Up to 30th September 1890.	During the year under report.		Up to 30th September 1890.	During the year under report.	Total of columns 8 and 9.	According to new settlement.	According to previous settlement.	Increase.	Decrease.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
				(a)										(a) No records of rights have yet been completed and finally published during the period under report. The attestation has been completed with regard to 104 villages, of which one only was completed before the beginning of the year under report.
Sadar Subdivision of Chittagong.	Chittagong ...	There are too many estates to be entered here.	579 This includes only the areas of Patia, Banskhali, Satkania, and Raojan, the only areas to which the Tenancy Act has yet been extended. The total number of villages in the whole subdivision is 933.			Of the villages in which attestation has been actually begun, 36,979; approximate number in the villages (579) in which attestation has not been begun is 381,600.	3,637	33,342	36,979	(b)	(b)	(b)	(b)	(b) The proposition statement for the settlement of the fair rents of 18 villages of the Satkania circle have been approved, but these owing to recent orders will be revised.

A.

Statement showing the Estates under Survey and Settlement during the year ending 30th September 1891 (*Ramoo*).

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimate in acres.	Whether surveyed by professional agency.	Area surveyed.			Number of villages of which the records have been handed over by the Survey Office to the Settlement Officer—		Total cost.						Rate per acre.		Increase of revenue—		Total of columns 20 & 21.	Remarks.
						Up to 30th September 1890.	During the year under report.	Total area surveyed.	Up to 30th September 1890.	During the year under report.	Up to 30th September 1890.		During the year under report.		Total.		Survey.	Settlement.	Actually obtained.	Expected.		
											Survey.	Settlement.	Survey.	ettlement.	Survey.	Settlement.						
1	2	3	4	5	6	7	8	9	10	11	12	12	14	15	16	17	18	19	20	21	22	23
						Acres.		Acres.			Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.	A. P.	A. P.	Rs.	Rs.	Rs.	
Chittagong	Chittagong	Old Thána Ramoo, in which there are too many estates to enter here.	50	156,390·40	Professional agency.	156,390·40	...	156,390·40	50	...	67,706 5 5	2,972 2 2	...	13,823 7 7	67,706 5 5	16,795 9 9	6 11	1 8	1,107	35,362	36,469	

B.

Statement showing progress made in Government and Private Estates and Temporarily-settled Tracts with the records of rights and settlement of rents up to 30th September 1891 (Ramoo).

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which records of rights have been completed—		Total number of raiyats (tenants of all kinds) in the villages in column 4.	Number of raiyats (tenants of all kinds) whose rents have been recorded and status determined.			Total rental of tenants paying direct to Government whose rents have been settled.				Remarks.
				Up to 30th September 1890.	During the year under report.		Up to 30th September 1890.	During the year under report.	Total of columns 8 and 9.	According to new settlement.	According to previous jamabandi.	Increase.	Decrease.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Chittagong ...	Chittagong	Old Thána Ramoo, where there are too many estates to enter here.	50	...	12 As regards raiyats only.	26,341	10,952	15,389	26,341	Rs. 90,126	Rs. 53,657	Rs. 36,469	...	

F. A. SLACK,

Settlement Officer.

APPENDIX H.

No. 17R, dated Calcutta, the 30th January 1892.

From—Lieut.-Colonel C. Strahan, R.E., Deputy Surveyor-General, in charge Revenue Branch, Survey of India,

To—The Director of the Department of Land Records and Agriculture, Lower Provinces.

Forwards a report of the Survey operations in Chittagong and Sarail during the survey year 1890-91, together with the table showing the survey results and cost thereof during the half-year ending 30th September 1891 for the same districts.

Report on the Survey operations in the District of Chittagong for 1890-91.

At a consultation held by the Director of Land Records during his visit to Chittagong, in December 1890, it was decided to make over all the writing of records in the Chittagong District to the Settlement Department, owing to the numerous revisions in the records of the previous season as submitted by the survey amíns, which were due to these men not being sufficiently acquainted with the dialect of the country to be able to understand the excessive complications of the different tenures. It was also decided to make such arrangements as would allow of the completion of the survey of the district by the end of the survey year, 1891-92; this area comprised the thánas Pattia, Raojan, Rangania, Hathazari, Fatikcherry, Mirki Sarai, Kumira and Islamabad, and amounted to about 650 square miles of cultivation and about 500 square miles of hills and jungle. To meet this demand for increased area, it was found necessary to increase the strength of the establishment by more than half as much again than had been intended. The scale employed for the cultivated tract was as usual the 16-inch; the jungle lands were surveyed topographically on the same scale, only the main drainage lines and boundaries however being shown; the hills were sketched on two-inch sheets reduced from these 16-inch maps.

2. The demarcation of village boundaries in the cultivated portion of the district was completed by the Settlement Department about the end of March, and was continued into the jungle portions for each village by the Survey Department where boundaries could be pointed out; but where they did not exist, the country was cut up into convenient blocks for survey, the boundaries being made in continuation of those of the adjoining villages which will be marked on the maps so as to render it clear to which village each block belongs. The demarcation of the Hill Tracts boundary was completed late in June after very great difficulty, but the demarcation of the thána boundary between Fatickcherry and Hathazari on the east and Mirki Serai and Kumira on the west could not be completed. The work on both these boundaries and in the jungle blocks presented exceptional difficulties; notwithstanding this, an area of 806 square miles was completed in traverse during the season.

3. The district, owing to the small size of the fields (about 13 to the acre), the large and intricate village sites with their close tangle of thick-set hedges, and moats surrounding homesteads, and the impenetrable nature of the jungle, offers immense difficulties to an economical survey. It is in fact about as difficult a district to survey as could be found in Bengal or elsewhere, and progress has been unavoidably slow, and cost of survey necessarily high.

4. The average daily progress made by the amíns under these circumstances was about 14 acres when working in cultivation, and only five acres in village sites. The total outturn for the survey year and the cost thereof will be found in the table at the end of the report.

5. At first maps for khanapuri were not supplied until each mauza was surveyed, but as this was found to cause great delay, some of the mauzas being very large and the maps thereof being in many sheets, it was decided that each sheet should be submitted to the Settlement Officer as completed, and in this manner the maps of 254 villages of new work were supplied to him during the season. Area statements were in like manner supplied to the Settlement Officer for the preparation of the records as fast as they could be finished; but the rapidity with which this could be done did not at first meet the expectations of the Settlement Officer. However, some delay in this respect during the field season was unavoidable for several reasons, but more especially on account of the useless expense of keeping up an establishment strong enough to cope with the work when coming in at its maximum rate, which was only occasionally the case; at other times, many of the men would have been sitting idle, and the remedy would have been as bad as the disease. In recess when a sufficient quantity of work was ready, the establishment was proportionately increased.

6. In office the following maps and areas have been supplied to the Settlement Officer and finished in drawing during the season:—

Names of thanas.	For khanapuri.		Drawing completed.			Tracings completed.		Area taken out.	
	Villages.	Area in square miles.	Villages.	Sheets.	Khasra numbers.	Villages.	Khasra numbers.	Villages.	Khasra numbers.
Satkania ... ... Banskhali ... ... Pattia	418	619	268	516	616,528	288	676,230	228	473,495

7. The number of traverse squads at work varied from 15 in January to 21 in June; the cost of traversing is Rs. 50·6 per square mile. The number of field amíns in December and January was 93, but they were increased during February, March, and April to 140, after which they were greatly reduced, as it was found impracticable to carry on out-of-door work owing to the floods caused by the early rains. The cost of field survey is Rs. 130·6; owing to the great difficulty experienced in preparing the records of the previous season's work, and the desirability of submitting as many as possible to the Settlement Officer before moving into the field, out-of-door operations were not commenced until the 10th December, and the office of the Dakhin Shahbázpur detachment with one assistant did not leave recess quarters until 1st January 1891. The revision of the khanapuri work of the previous season in Chittagong had been carried on from the early part of November.

8. The inhabitants are very law-abiding, and on the whole well-disposed, but they took more interest in the khanapuri than the survey work, and appeared to be imbued with a certain amount of suspicion as to the reason of both; however, they seldom offered any obstruction to the progress of the survey, and are eager about their possessions being written up.

9. It does not appear probable that the class of men obtainable in the district would ever make good or zealous field surveyors. The work would be too arduous for them, and requires more dexterity than they seem to possess. The few candidates who have offered themselves for service have not proved very successful. Local menial labour can be had, but is of an uncertain nature, as the men will not work all day, or every day, and when the hot season is on, they cannot do without umbrellas, while the feast of the Ramzan renders them unfit for outdoor work for a month. They work on a daily hire of four annas in the open and six annas in jungle, whereas khalásis imported from India will take service at Rs. 8 a month, and work steadily at all times at that rate.

10. Mr. C. G. H. Allen, C.S., now Assistant Settlement Officer, was instructed in surveying during the early part of the year.

Report on the operations in district Tippera, pargana Sarail.

1. In pargana Sarail, district Tippera, kistwar and khanapuri work combined were carried out. At the end of last field season a small area of 23·19 square miles of field survey, and 44 villages equal to 77·18 square miles of record writing, were left incomplete. To finish these areas a detachment at first consisting of 20 amíns with inspectors, &c., under an assistant surveyor was deputed; after the first fortnight the detachment was reduced by ten amíns, who were transferred to Chittagong, and after that as each man completed his allotted task, he was transferred to Chittagong.

2. The kistwar was finished early in January 1891, and the khanapuri by the end of March, the detachment remaining in the field till the end of April to supply the Settlement Officer with as many records as possible before going into recess. A severe storm, which completely destroyed the office huts about the 25th April, necessitated a hasty return to recess quarters, but the records of 181 villages were supplied before doing so. The remaining records were completed and sent to the Settlement Officer in small instalments as a certain number of villages were got ready, and by the end of October the whole of the estate had been completed and sent.

3. The field work was performed entirely by Hindustani agency, each amín being supplied with a muharrir whose pay varied from Rs. 10 to Rs. 12 to write the khasra in Bengáli, while they themselves kept a check record in Urdu. The Hindustani amíns were able to write 80 to 100 numbers daily; the local patwáris employed last season did 25 to 30 numbers daily; none of them came forward to offer their services this season. A large number of local men and men from Dacca were employed in office in preparing the records, superintended by men who had received a thorough training during the previous season, and the results were more satisfactory than last year. The use of fractional figures instead of decimals to show parts of a kani in the khatians gave much trouble, and very great difficulty was experienced in defining the limits of the mahal chaks from the old maps.

4. The raiyats showed the same indifference as last year to the progress of the work, and would not attend to point out their fields. They were said to be biding their time to contest the Settlement Officer's operations hereafter. The lands are rich and highly productive, the large class of land-owners are comparatively opulent, and the ordinary cultivators very well-to-do, and both as a rule are highly independent and very litigious.

5. The outturn for the year and the cost thereof will be found in the table at the end of the report.

Survey year 1890-91.

Name of District.	Outturn.									Cost rate per acre.				Total cost exclusive of charge for instruments.	Remarks.
	Traversing.			Topography.						Survey.		Stone embedding.	Record writing (khanapuri).		
	Number of stations permanently marked.	Number of village, river and jungle circuit.	Village boundary survey.	Cadastral survey, 16 inches = 1 mile.	Skeleton topographical survey 16 inches = 1 mile.	Topographical, 2 inches = 1 mile.	Number of villages.	Number of fields.	Average size of fields.	Traversing.	Cadastral, 16 inches = 1 mile.				
			Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.			Acres.	As. P.	As. P.	As. P.	As. P.	Rs.	
Chittagong	27,644	502	806	349	120	82	505	1,650,875	0·13	1 3	3 3	0 2	...	(*a*) 1,27,024	Mr. Shoek gives Rs. 1,32,540 as the expenditure under this head. M. F.
Tippera (Sarail) ...	62	...	...	23	...	...	16	20,351	0·72	...	3 9	...	1 9	(*b*) 27,409	

(*a*) Includes Rs. 722 and Rs. 2,168 expended on completion of cadastral maps and records of Wards and Government estates respectively in pargana Shabázpur, district Backergunge.
(*b*) Includes Rs. 1,016 for connecting Sambhusara, G. T. S., with M. C. No. 1 and office work.

Surveyor-General's Office,
Revenue Branch,
Calcutta, 30th January 1892.

CHAS. STRAHAN, Lt.-Col., R.E.,
Deputy Surveyor-General,
In charge Revenue Branch, Survey of India.

Statement showing the estates under survey and settlement of revenue during the half-year ending 30th September 1891.

Division.	District.	Number of estates.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed.			Number of villages of which the areas have been submitted by surveyor to the settlement officer.		Total cost up to						Rate per acre.		Remarks.
						Up to 31st March 1891.	During the half-year under report.	Total area surveyed.	Up to 31st March 1891.	During the half-year under report.	31st March 1891.		During the half-year under report.		Total.				
											Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Chittagong	Chittagong	Nine thánas of the Sadar subdivision.	933	Cultivation ... 807,680 Jungle ... 232,960 or 1,626 square miles.	Professional agency.	Acres. 376,290	Kistwar ... 89,072 Jungle topography ... 76,800	Cultivation ... 465,362 Jungle ... 76,800 Total ... 542,162	101	166	Rs. A. P. 1,55,324 0 11	...	Rs. A. P. 69,817 13 3	...	Rs. A. P. *2,25,141 14 2	...	As. P. 6 7	...	
											Sarail.								
	Tippera ...	Pargana Sarail ...	299	181,334	Professional agency.	181,334	.....	181,334	191	108	80,723 15 2	...	10,887 15 8	...	91,611 14 10	...	8·08	...	

* Includes cost of traverse survey of 34 pátni villages, area 22,215·63 acres.
N.B.—No field work was done in Dakhin Shahbázpur during the year.

CAMP NAZIR HAT,
The 6th January 1892.

F. GRANT,
Offg. Deputy Superintendent,
In charge, No. 2 Party (Eastern Bengal.)

APPENDIX I.

No. 980R, dated Jalpaiguri, the 16th November 1891.

From—E. E. Lowis, Esq., Commissioner of the Rajshahi Division,

To—The Director of the Department of Land Records and Agriculture, Bengal.

With reference to your circular No. 15T.A., dated 17th October 1891, I have the honour to forward, in original, a letter No. 814, dated 9th November 1891, with enclosures, from the Settlement Officer, Western Duars, Jalpaiguri, to your address.

2. From the enclosed statements it will be observed that Mr. Sunder has not taken credit for all the work that has been done during the past year. In fact, the settlement record regarding the whole 3,507 jotes entered in column 4 of statements A and B is complete, but only in the case of 1,192 jotes have completion figures been returned, because in other jots though the papers are complete, the entries had not been explained to the tenants by the close of September. Since then the work has been pushed on, and but little, I am informed, remains to be done. I had hoped to have submitted a completion report regarding Mynaguri tahsil before I retired, but have been unable to do so, since there are about 100 jots scattered about North Mynaguri and Chengmaree that still remain to be surveyed; so that the Settlement Officer cannot give me correct figures regarding the relative amounts of waste or cultivated or the actual increase of revenue. These jots were omitted by the survey party through what appears to have been great carelessness, and their existence was only brought to light when Mr. Sunder took the field, and going from jot to jot, as he had to do, became aware of the existence of cultivated lands regarding which no maps or papers had been furnished by the survey. These are said to have been all arable waste land jots which had not been demarcated by the officer who was deputed to mark off the jots by means of the maps, &c., pertaining to the mal jots in the Deputy Commissioner's office. All the mal or original jots were demarcated; but the Demarcation Sub-Deputy was not supplied, it would seem, with all papers connected with the more recent or arable waste land jots, and so it happened that, as regards many of the latter, boundaries were not marked off, and they were returned by the survey as Government khas. The difficulty and delay which has been caused need not have arisen if the survey authorities had brought to notice the existence of these undemarcated jots and solicited orders in respect of them.

3. The actual increase of revenue has not been ascertained, but it will probably amount to Rs 60,000 on the whole tehsil. The increase is due to the large extension of cultivation in North Mynaguri and Chengmaree, and also to the assessment at enhanced rates. The increase in the case of individual jots has often been very considerable, and in order to lighten the burden of enhancement, I proposed to spread the increase over a series of years—a proposal which was sanctioned by Government and has been carried into effect. As pointed out by Mr. Sunder, the operations, both survey and settlement, have been seriously interfered with by sickness. Malarious fever must always be counted on in the Duars, but to this was superadded this season a virulent outbreak of cholera, which for a time broke up Mr. Sunder's camp and completely demoralized his establishment; in fact it was with difficulty that he could get his amín and others to resume work. The climate of the Duars is a deadly one, and appears to prostrate the strength and energy of all who have to encounter it, even though they may escape actual attacks of fever; and in judging of the outturn of work this very serious impediment to progress must not be forgotten.

4. In paragraph 16 Mr. Sunder alludes to the correspondence that has passed in connection with the very important question of the fixing of a fair rent payable by the chukanidar. The matter was referred to Government through you by my No. 514Rct., dated 22nd September 1891, and rents are now being fixed in accordance with the orders passed.

5. *Timber-bearing tracts.*—The important question of the manner in which such tracts should be dealt with came under discussion during the year, and orders were passed by Government; but as I have asked for a reconsideration of those orders, I need not do more than allude to the matter as one ultimately connected with the settlement of the Duars, which should be settled at an early date.

6. I regret that I have had no opportunity of submitting a completion report on the resettlement of the Mynaguri tahsil and of recording my views on more than one subject connected with the settlement operations, and as I retire from the service immediately, the opportunity will not offer itself in the future; but I cannot conclude these remarks without bearing testimony to the very valuable assistance that I have received from the Settlement Officer, Mr. Sunder. He has worked early and late, and devoted his best energy to the work on which he has been engaged. His acquaintance with the colloquial of the district, his knowledge of the people and their ways and customs, conveniently fitted him for the post of Settlement Officer for which I selected him, and those qualifications have been unsparingly devoted to the Government service. In order to secure continuity of administration, and for the preservation of Government interests, I am very strongly of opinion that a manager should be appointed to have charge of the Government estates of the Duars under the Deputy Commissioner, and I know no man in Bengal better fitted for the post than Mr. Sunder.

No. 814, dated Jalpaiguri, the 9th November 1891.

From—Donald Sunder, Esq., Settlement Officer, Western Duars,
To—The Director of Land Records and Agriculture, Bengal.

With reference to your circular No. 15T.A., dated 17th October 1891, and subsequent telegram, I have the honour to submit the following report on the survey and settlement operations in the Western Duars of Jalpaiguri district for the year commencing 1st October 1890 to 30th September 1891, inclusive. The delay in submission of this report sooner is due to my having been seriously ill from bronchitis, which incapacitated me from attending to work for some days, as also to the non-receipt of information from the Survey Department until 28th October 1891.

2. For want of papers from the Survey Department no settlement work was done prior to 28th November 1890; hence, instead of sending you a separate report for the half-year ending 30th September 1891, I submit this report embracing the period from October 1890 to end of September 1891, inclusive.

3. When the survey of the Duars was commenced in November 1888, jot boundaries were not properly demarcated, and the surveyors found considerable difficulty in proceeding with work, as, owing to some mistake, none of the jot records of last settlement were supplied to them. When the new records of jots in pargana South Mynaguri were supplied to this office, they were found to be incorrect and entirely opposed to facts, and all the papers had to be returned to the Survey Department for revision. Thus a large amount of work had to be redone, while many records had to be rewritten. This delayed any settlement work being commenced until the end of November 1890.

4. The subjoined table shews the names of officers in the Settlement office during the year under report :—

Name of Officer and Designation.	Period Employed.		Remarks.
	From.	To.	
Mr. Donald Sunder, Settlement Officer.	October 1st, 1890 ...	September 30th, 1891	Joined on 20th January 1890.
Babu Haris Chandra Rai, 2nd Settlement Officer.	November 5th, 1890 and again from June 1st, 1891.	February 28th, 1891 August 24th, 1891.	Joined on 5th November 1890.
Babu Ram Chandra Sen, Acting 2nd Settlement Officer.	March 1st, 1891 ...	May 31st, 1891 ...	Joined on 1st March 1891.
Babu Rash Mohan Chandra, Assistant Settlement Officer.	November 6th, 1890 ...	September 22nd, 1891	Joined on 6th November 1890.
Babu Upendra Chandra Mukerjea, Assistant Settlement Officer.	September 17th, 1891	September 30th, 1891	Joined on 17th September 1891.
Babu Jadab Chandra Mazumdar, Assistant Settlement Officer.	September 21st, 1891...	Ditto ...	Joined on 21st September 1891.
Babu Harilal Gupta ...	September 23rd, 1891...	Ditto ...	Joined on 23rd September 1891.

5. The settlement work was under my charge throughout the year under report.

6. My assistant, Babu Chandra Kanta Gangoli, having taken furlough, the post which he had held was abolished and two assistants were appointed instead of him. One of these was Babu Haris Chandra Rai, who was designated Second Settlement Officer, and the other was Babu Rash Mohan Chandra, who was gazetted as Assistant Settlement Officer. Babu Haris Chandra Rai reported himself to me on 5th November 1890, and was employed up to 7th December in the office. On 8th December 1890 he was deputed to demarcate the boundary between Bhutan and Jalpaiguri and did this work up to 1st March 1891, when his health failed and he proceeded on sick leave. He was succeeded by Babu Ram Chandra Sen who completed the demarcation work and threafter was employed on attestation work and classification of soil of jots in two taluks of pargana North Mynaguri, of Mynaguri tahsil. He did not know English, and was of little use, being unable to write any notes on the jots which he had inspected. On June 1st, 1891 he was relieved by Babu Haris Chandra Rai, who was sent out to pargana North Mynaguri, and was employed there in checking classification of soil of jots and attestation work; but he frequently complained of being ill from fever and unfit for duty, and this caused his transfer to Orissa on 24th August 1891. As to the other officer, Babu Rash Mohan Chandra, shortly after his appointment he suffered from an attack of conjunctivitis, which prevented his being employed in the mufassal. On 17th April 1891 he was sent out to attend to attestation work and checking of khanapuri in taluk Hai Haipathar of pargana North Mynaguri, but failed to do anything, as he became ill from fever and returned to Jalpaiguri on 12th May 1891. He was sent out again on 21st May 1891, but again became ill from fever and returned to my camp at Kyranti on 5th June 1891, where he was employed from 6th to 14th June 1891, in helping me with completion of attestation work in parganas Chengmari and North Mynaguri. On 15th June 1891 he returned to Jalpaiguri and was employed on general work in the office up to 20th August 1891, when he

was sent to taluk Baradigi of pargana North Mynaguri to check classification of soil and complete attestation work in connection with new records of some jotes which the Survey Department were late in furnishing. He returned to head-quarters on 5th September 1891, and did no work after that, as he complained of being ill from fever. He availed himself of leave without pay on 22nd September 1891, and has now been sent to Dinajpur as Sub-Deputy Collector in the regular line.

7. Since the transfer of the above-named officers, three new men have been appointed to fill their places, viz., Babu Upendra Chandra Mukerjea, who was income-tax assessor of Dinajpur, Babu Jadub Chandra Mozumdar, who was a kánungo at Rampur Boalia, and Babu Harilal Gupta, who was a clerk in the office of the Commissioner of the Rajshahi Division. None of these officers know anything of settlement work or of the Western Duars; but they are learning, and are now employed in pargana Moraghat in collecting information to enable me to furnish a report as to the rates which should be adopted for jots in Falakata tahsil. It will thus be seen that I have been very handicapped from the beginning, and have worked almost single-handed in the settlement of Mynaguri tahsil, which comprises more than one-third of the work which has to be done in the Western Duars. I have had no help from my assistants. I commenced attestation work, recording of rights and checking of classification of soil of jots in taluks of pargana South Mynaguri, on the 28th November 1890, and went on from there to taluks of parganas North Mynaguri and Chengmari. All attestation of jotdars' and chukanidars' holdings and work of recording of their rights, &c., in the three parganas of the Mynaguri tahsil was completed by 28th June 1891, when I returned to Jalpaiguri.

8. No work was done in the mufussal between 1st and 15th April 1891. Cholera broke out in the Duars and compelled us to return to head-quarters. Out of a camp of about fifty men, twelve men died of cholera and fever in the first fortnight of April, and from then up to the time of my return to head-quarters, work was carried on under very trying circumstances and with much difficulty. The rains commenced early in May 1891, and repeated attacks of fever so seriously affected the health of most of my muharrirs in camp, and so many deaths had occurred and frightened the men, that I found it impossible to persuade them to remain out after 20th June 1891.

9. *Tour.*—I was absent on tour for 217 days during the year; Babu Haris Chandra Rai was out for 141 days; Babu Ram Chandra Sen was out for 87 days; Babu Rashmohan Chandra was out for 90 days; Babu Upendra Chandra Mukerjea was out for 10 days, and Babu Jadub Chandra Mozumdar for 7 days. I have stated in paragraph 4 as to how each of the above-named officers was employed during the year.

10. In the work of attestation, entries in the records relating to holdings of 11,890 jotdars and 5,089 chukanidars have been explained to them, and they have also been informed as to what land is in possession of 11,392 adhiars who are under them. Their rights have also been recorded. Three thousand five hundred and seven jots, covering 1,62,063·39 acres of land, in 71 taluks of parganas North Mynaguri, Chengmari, and South Mynaguri, were inspected, and attestation of the holdings of the above-mentioned jotdars and chukanidars was completed in camp. Owing to the great sickness and outbreak of cholera, as mentioned in paragraph 8, it was not possible to complete in camp calculation of Government revenue payable on account of *all* the jots, or to announce to *every* jotdar and chukanidar what increased revenue and rent they will have to pay. A portion of this kind of work had to be done at head-quarters during the recess, and printed notices, being extracts from khatians, are being issued by me personally to jotdars, informing them (1) as to how much land they had at last settlement; (2) what revenue they paid for it; (3) how much land they have by the present settlement; (4) what amount of revenue they will have to pay; and (5) steps by which the revenue payable by present settlement will rise. For chukanidars, we are preparing a similar notice giving them full particulars from the khatians as to how much of each class of land is contained in their holdings, and what rent is being paid to the jotdar for such land as recorded by us and ascertained from them in camp. These notices to the chukanidars will shortly issue.

11. *Demarcation.*—The total number of jots demarcated during the year was 2,863. The work of demarcation was done by a native surveyor, who was assisted by a staff of 16 amíns, and all papers necessary for the Survey Department were furnished to that Department, taluk by taluk, as soon as finished. In some cases jots which had been demarcated during the previous year had to be redemarcated during the year under report, as the earthen mounds which the amíns had erected were either washed away or had been covered up by jungle and grass, and could not be found by the Survey Department. In consequence of cholera and much sickness among the amíns of the Survey Department, many jots which were demarcated could not be measured; but this work will be completed during the ensuing cold season, and it is hoped that it may not be necessary for the surveyors to return to the Duars after next year.

12. *Survey.*—From the enclosed statement, marked A, it will be seen that 155,532·80 acres of land were surveyed during the year under report. These figures are taken from Captain Hodgson's monthly progress reports. In his report for September 1891, it is stated that only six square miles of land in the whole of the Duars remain to be cadastrally surveyed; but this, I believe, is incorrect. The traverse survey of two blocks of land, covering 58,679 acres, or about 91 square miles, in Falakata tahsil, remains to be done. The land contains several jots which will have to be cadastrally surveyed. Traverse survey of about 600 acres of land in taluk Sesuabari and Morichbari of pargana South Mynaguri

will have to be made, and cultivation thereon will have to be cadastrally surveyed. Several jots in parganas North Mynaguri and Chengmari were omitted from survey and will have to be done. All that remains unfinished will, it is hoped, be completed by the Survey Department during the ensuing cold season. I am not in a position to state exactly how much work remains to be done by the Survey Department, as Captain Hodgson has refused to supply information without the permission of the Surveyor-General.

13. *Receipt of records from the Survey Department.*—The records of 3,430 jots were received from the Survey Department during the year under report. These are records of Falakata tahsil as well as Mynaguri tahsil. In some cases the records were carelessly prepared and had to be returned to the Survey Department for revision. Great delay and trouble had been caused in my office in dealing with records supplied by the Survey Department. In several cases figures given in chittas against the name of a person were found to disagree with those entered in the khatians in the name of the same person, and the totals contained in the abstracts were found to be wrong. The correcting of such errors and recopying of papers in my office has caused great loss of time.

14. *Boundary disputes.*—Five hundred and nineteen cases said to be boundary disputes were pending at the commencement of the year, and 835 fresh cases were received from the Survey Department during the year. The total number of cases was 1,354. Out of the above, 848 cases were disposed of, leaving 506 cases of Falakata, Alipur, and Bhalka pending at the close of the year. The majority of the cases which were disposed of related to streams and roads which the Survey Department were directed by Mr. Walsh to show as Government khas. Objections of jotdars were recorded by the Survey Department, but when inquiry was made at time of attestation, the plots to which they referred were either recorded as in Government khas possession, or as in possession of the jotdars, according to the circumstances of the case. Where a stream is a running one and supplies water to several jots, it has been recorded as Government khas, and where it gives water to only a single jot, it has been included as part of that jot.

15. *Khanapuri.*—When survey operations commenced in 1888-89, the Survey Department was instructed to khanapuri according to nature of the land. There are two kinds of crop-yielding land in the Western Duars, viz. "rupit," from which the cold weather or amun paddy is obtained, and "faringati," which gives to the cultivator the bhaidai or early paddy, as also tobacco, jute, and all rabi crops. The jotdars know these lands as "haimanti" and "bhadai," or "dola" and "danga." The surveyors were instructed to make khanapuri as 1st, 2nd, and 3rd class rupit, and 1st, 2nd, and 3rd class faringati. The surveyors and North-West amins were confused, and failed to distinguish 1st class faringati from 2nd class rupit. Jotdars never attempt to classify land themselves, and they were in dismay at the work of the Survey Department. When the settlement proceedings commenced, I tested the khanapuri work of the survey amins and found it impossible to classify rupit and faringati into 1st, 2nd, and 3rd class. Jotdars protested and said to me, "We cannot divide our lands into 1st, 2nd, and 3rd class, so how can you? We only know high land (faringati) and low land (rupit);" and they asked me to classify as they understand things. Accordingly, I have classified land in the whole of the three parganas of North Mynaguri, Chengmari, and South Mynaguri of Mynaguri tahsil, as noted below:—

(*a*) Basti (includes homestead, garden, and bamboos).
(*b*) Rupit.
(*c*) Faringati.
(*d*) Doba (fish ponds).
(*e*) Waste.

I have classified as rupit all low land and all land on which two crops, viz., bhadai paddy and áman paddy, are generally grown in one year; and I have shewn as faringati only actual high land on which tobacco and rabi crops are grown. This system of classification is understood by jotdars and their under-tenants, and has been accepted by them. In some cases the fact of a field being faringati has been challenged; but when it was pointed out that the land was dofasal, and that a crop of jute as well as one of áman paddy has been obtained from it in the same year, there was no further objection to the land being classed as rupit. Khanapuri work of the Survey Department is regularly tested on the fields, and any changes which are necessary in consequence of bad work of the amins and surveyors, is corrected at once and before attestation of holdings is proceeded with.

16. *Fixation of rent, &c.*—As regards fixation of rent of chukanidars and under-tenants, my instructions were to simply record the amount which the chukanidar is paying at present and to leave it to the jotdar, if he is dissatisfied, to institute a case for fixing a fair rent to be paid by the chukanidar. While proceeding with work in taluks of North Mynaguri and Chengmari, I pointed out to the Commissioner of the Rajshahi Division, under whom I am employed, that the settlement cannot possibly succeed if the above-mentioned instructions be adhered to in the case of jots in parganas North Mynaguri and Chengmari. Prior to the present survey and settlement operations, blocks of jungle land in these parganas had been taken up for cultivation by Meches, Garos, Nepalese, and Rajbansis, from whom the tahsildars used to realize Government revenue annually at Rs. 4 per hal of land, that is, for as much land as a man could cultivate with a single plough. Revenue was not recovered at any rate per acre on the area of land which the man had held. Thus one man, or two or three men jointly, often had a block of

50 or 100 acres of land for which they paid only Rs. 8 or Rs. 12 as Government revenue through their mondol or headman. When the survey began all land of the above description was found under cultivation and was measured according to possession, the mondol being shown in the records as the jotdar, and the people who had broken the land being entered as his chukanidars and adhiars. At time of attestation these chukanidars were found in possession of land for which they are paying the jotdar the nominal rent of Rs. 4, while the revenue payable to Government by the jotdar for it according to the present settlement comes to about Rs. 15, the land being good rupit and entirely under cultivation. I explained to the Commissioner that, under these circumstances, it is necessary to permit me to fix a fair rent to be paid by these chukanidars. I also pointed out that, owing to great extension of cultivation, the revenue payable by jotdars is rising, and that it was unfair to them not to interfere in the matter of chukanidars' rents. Some chukanidars had taken up waste jungle land on jots at Re. 1-8 and Rs. 2 per acre. Now all the land, being entirely cultivated, it is only right that we should fix a fair rent for the chukanidar without compelling jotdars to proceed to the Courts to obtain enhancement of rent. Jotdars of the Duars, as a rule, make short work of chukanidars who object to pay a fair rent. They are prevented from ploughing, their cattle are repeatedly impounded, false complaints are made against them, and they suffer no end of worry and trouble. Chukanidars know only too well that, if they do not satisfy the demands of the jotdars, they will be compelled to leave the jot. None of the chukanidars have lease, and jotdars allege that they should either be made to pay a fair rent or to give up their holdings for men who are willing to take them up on the jotdars' terms. I explained this to the Commissioner, whose instructions on the matter as contained on his letter No. 477 Rct. of 15th September 1891, are given hereunder :—

"I have the honour to acknowledge the receipt of your letter No. 622, dated 4th September 1891, and, in reply, to state in the case of the Meches who have hitherto been paying dao tax, you are certainly justified in fixing the amount payable by the chukanidar to the jotdar as well as the rent due by the latter. In fact, the persons who have been entered as chukanidars really hold no real chukani title, and you are bound to fix what constitutes a fair rent for them to pay to the jotdar, and record such amount in the settlement papers, letting both jotdar and chukanidar know that the sum so entered represents the rent payable by the one and realizable by the other during the currency of the pending settlement. So far as the Mech and Nepalese cultivators referred to are concerned, the above orders dispose of the case; but your letter appears also to ask for instructions on the wider question of the right of the Settlement Officer to interfere in the case of all chukanidars who may be holding at rates which, if recorded as the future limit of the jotdars' demand, will not admit of any enhancement of the latter's rent at the rates lately sanctioned by Government. This wider subject lately came under consideration, when I examined the assessment papers in order to dispose of certain appeals against the enhancement of rent, and in deciding these appeals I passed orders which deal with this question. I have deemed it advisable, however, to take the present opportunity of again recording my opinion in the matter. There are two main objections that may be urged against the adoption of your proposal to record in certain cases in the settlement papers, as the sum payable for the future by chukanidars, not the existing rent, but what you may judge to be a fair rent. The objections are (1) that, according to the principle accepted in the Tenancy Act as underlying the laws for settlement of rent, the existing rent must be assumed to be the fair rent until the contrary be proved; (2) the distinct order that, in the case of chukanidars, the existing rent alone shall be entered, and the jotdar be held incapable of enhancing except by a regular suit. As to the first objection I admit the existence of the general principle, but deny its applicability in the present instance. Existing rents can only be assumed to be fair rents under certain conditions, that is, when the tract of country under settlement has been long enough in occupation for the rate of rent to become settled by competition and usage; the above assumption cannot be made in the case of a tract of country lately occupied, and in the process of being reclaimed from waste. In the former case we will probably find that competition and usage have secured a high but uniform level of rent; in the latter we are certain to find great want of uniformity in rates of rent; the rates even for contiguous land being very divergent, the difference being due to the longer or shorter period that has elapsed since the land was reclaimed. That this must be so will be apparent, if we examine the conditions under which lands are let for purposes of reclamation. Waste lands are settled with the jotdar by Government at a regular rate per acre; the jotdar, however, does not sublet according to any fixed rates; but an intending cultivator takes a block of waste agreeing to pay a lump sum, the amount of which varies according to the quality of soil and difficulty of reclamation. The rent is, of course, always an easy one, but it is understood that when the land has been brought under cultivation a fair rent will be fixed at some future period: the length of time during which the low rent shall be payable is not fixed; the duration of the period depends on the difficulty of reclamation, and partly no doubt on the easiness or good nature of the jotdar. There is no written lease, but the understanding is, that sooner or later the rent shall be liable to enhancement. There are no established rates of rent: the whole arrangement is a matter of private arrangement between the jotdar and his chukanidar; there is no fixity even regarding the period that may elapse before enhancement takes place, but the underlying agreement is well understood, that when the land is under cultivation the original low rate shall be exchanged for a higher one. In such a condition of things it is absolutely impossible to assume that any existing rent is a fair rent. It only remains to examine the

conditions of things in Mynagori tehsil, in order to determine whether the principle alluded to applies or not. In South Mynaguri the land has for years been under cultivation; there has been no increase in cultivation since the last settlement, for there is no culturable waste left to be taken up. There competition for land tempered by the existence of waste waiting to be taken up in the near neighbourhood, has indeed raised the rent payable by chukanidars, but we do find some uniformity in the rate of rent and a settled condition of things that warrant us in assuming the existing rent to be the fair rent, and in recording the same as the limit of demand during the pending settlement. In North Mynaguri and Chengmari the state of things is very different. A large proportion of waste existed at the last settlement, much of which has been brought under the plough during the last few years and is still held under the easy terms on which the waste was originally let, while rates obtained by reducing the lump rent to the amount payable per acre are very divergent; contiguous holdings, often in the same jot, and of the same quality of land, paying anything from Re. 1-8 to Rs. 4 per acre. Here the objection does not apply, for we cannot assume that the existing rent is in any case a fair one. As regards the second objection, it is true that an order exists under which existing chukani rents must be recorded, with no option on the part of the Settlement Officer to vary them or on the part of the jotdar to enhance except after a regular suit; it is a question, however, whether this order has any reference to such cases as we find existing in North Mynaguri and Chengmari. My first impression regarding chukani tenures obtained after an examination of such papers relating to the past settlement as were available, was that the tenure is a permanent one,* held under a written lease and at a fixed rate of rent. I thus described them in my preliminary report to Government, and under this impression the order alluded to was passed enjoining the record of existing rates:—"Experience has, however, shown me that my first impression was a mistaken one, and that, though theoretically the tenure may be such as I have described above, in reality it is of a different character. A written lease is apparently never given, and though the rough agreements under which blocks of waste are let as described above are called chukanis, they are clearly agreements which involve no fixity of rate of rent. To leases of the latter description the orders alluded to were never intended to apply, for that there were chukani tenures of this description, was not at the time understood or suggested. I would, therefore, limit the application of the rule to cases which fulfil the conditions mentioned above; that is, where there is a written lease defining the position of the tenant and fixing the rent payable by him, the above rule must be held to apply. I would also extend its applicability to cases in which there is no written agreement, but where the tenant has been for some time in possession at an unchanged rate of rent sufficiently long to indicate that he holds at settled rates. In all other cases I am inclined to hold that the rule referred to does not restrict the Settlement Officer's power to settle a fair rent payable by the chukanidar, even though in doing so he may have to enhance existing rent. On the whole, I am of opinion that in many instances the agreements in North Mynaguri and Chengmari entered into between the jotdars and their so-called chukanidars, are not of such a permanent nature as to bring them within the limitations imposed by the two objections alluded to. While, however, holding that interference is, in many instances, quite permissible, I do not consider that it would be judicious on your part to interfere in every case. The final settlement of a fair rent may very well be left to the parties themselves, and interference is to be avoided, unless Government interests are likely to suffer by delay in recording a fair rent, or unless the jotdar or chukanidar invoke your interference. It may happen that, as pointed out in your letter, the existing rents paid by chukanidars are for some reason so low that the aggregate does not enable the jotedar to pay the Government rent assessed at the sanctioned rates. In such a case, if you are convinced that the enhanced Government rate may properly be imposed on the jotdar, you should at once take step to assess a fair rent payable by the chukanidars, enhancing the same to such an extent as to leave the jotdar a profit after paying the Government rent. In thus assessing a fair rent on the chukanidar you will, of course, be guided by the rates paid for similar lands by other chukanidars in the neighbourhood. The assessment, I may add, in cases of this nature must be made in consultation with the jotdar and his tenants. Enhancement, however, need not be insisted on, if the jotdar objects; for it may happen in the case of a tea-planter, for instance, that he is willing to forego profits and allow his garden coolies to occupy at nominal rates for the sake of their services. In such cases, however, it must be clearly understood that the enhanced Government rent will be imposed on the jotdar, even though he may find it convenient not to insist on obtaining any enhancement from his chukanidars. I shall be glad to know when you have commenced to carry out revision of the chukani rents in the light of these instructions, for after a commencement has been made, I wish to inspect the work done in order to satisfy myself that the orders have been properly understood."

* The order referred to was passed by Government *because* Mr. Lowis said the chukanidars' rents were fixed permanently by the jotdar, and so far as the jotdar was concerned could not be altered. When it became known that the statement was not correct, the order was modified.

M. F.

17. The above instructions are now being acted upon so far as jots in parganas North Mynaguri and Chengmari are concerned. As regards chukanidars in pargana South Mynaguri, the rents which they are paying at present has been recorded as payable to the jotdar, and no change will be made except by mutual consent; but there are some cases even in South Mynaguri in which chukanidars are paying very insufficient rent for their holdings, and for whom I should be permitted to fix a fair rent. If we do not fix this rent, I have no doubt that it will be taken by the jotdar without proceeding to the courts or

that the chukanidars will be forcibly ousted, and will have to relinquish their holdings in spite of everything that has been done for their protection.

18. *Assessment of land revenue.*—In assessing the revenue payable to Government by jotedars, the points which I have considered are (1) situation of the jote, (2) its nearness to roads, markets and tea-gardens, and (3) the circumstances of the jotedar and his ability to pay the revenue every year with ease. A considerable number of the jotedars of Mynaguri Tehsil are Nepalese and others who reside in Kurseong, Tindaria, and other parts of Darjeeling district; pleaders, traders, and money-lenders of Jalpaiguri, Hooghly, Kuch Bihar, and Rangpur districts; and Muhammadans of the neighbouring estate of Bykantpur. The jotedars of Mynaguri have been especially benefited by roads and markets which have opened out every part of the tehsil; their crops are easily sold, and with good profits, to tea-garden coolies; their jotes are well under cultivation and yield good crops, and their condition is prosperous in every respect. The tehsil is well advanced, and is at present the best cultivated part of the Duars. The increase of revenue in the three parganas of Mynaguri tehsil by this settlement will not be below Rs. 60,000, and will be due chiefly to the enormous extension of cultivation on nearly every jote in parganas North Mynaguri and Chengmari, as also in some taluks of South Mynaguri; to the recovery by the present settlement of the amount which was remitted nearly seven years ago under the reduction scheme which Colonel Morton had recommended; to the increased area of nearly every jote, the additional land having been held either surreptitiously by the jotedar or be payment of capitation tax; and to the application of the rates which have been sanctioned for this settlement. In cases in which the revenue has risen high, chiefly in taluks of parganas North Mynaguri and Chengmari, the increase has been spread over five years so as to enable the jotedars to pay without difficulty, When Lord Ulick Browne submitted Colonel Morton's reduction scheme for consideration of Government, he observed that Colonel Morton had expressed an opinion that "the mistakes of the last settlement or, in other words, the causes of the over-assessment were three viz.,—

(1) Insufficient classification of land.
(2) No allowance being made for injury to crops by wild animals.
(3) Too sudden an increase in the total rent payable for a jote."

Remembering these points, I have taken every care to avoid similar mistakes in the present assessment of the Government revenue.

19. *Training and utilization of Patwáries and Kánungoes.*—No patwáries or Kánungoes exist in the Duars. The Government revenue is collected by tahsildars, who supply all information which is required from time to time regarding jotes and their tenants. These officers and the men who are employed under them will have to keep the records of the present settlement corrected to obviate another survey of the Western Duars.

20. The annexed statements furnish all particulars as to cost of the survey and settlement operations in the Western Duars from the beginning up to the end of September 1891. Information regarding the work done is also given, and I hope will be considered satisfactory.

21. In closing this report I would mention that my work has been considerably delayed in Mynaguri tehsil by the number of cases of mutation of names which had to be disposed of. Great difficulty was also felt in making people pay the fees for mutation of names in cases in which they had got the survey amíns to shew their names in the new records as owners of the jotes without applying to the Deputy Commissioner of Jalpaiguri to have their names entered in the records. They had hoped to escape paying the fees, and they paid up only when threatened with resumption of the jotes. Five hundred and forty-one cases of mutation of names were disposed of. Evidence as to possession was recorded in every case, and Rs. 2,456 were realized by me on account of mutation fees.

APPENDIX.

Statement showing the Estates under Survey and Settlement of Revenue during the year ending 30th September 1891.

Division.	District.	Number of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed—			Number of villages of which the records have been handed over by the Survey to the Settlement Officer—		Total cost up to—						Rate per acre.		Increase of revenue.		Remarks.
						Up to 30th September 1890.	During the year under report.	Total area surveyed.	Up to 30th September 1890.	During the year under report.	30th September 1890.		During the year under report.		Total.				Actually obtained.	Expected.	
											Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Rajshahi...	Jalpaiguri...	Western Duars Government estate.	Mynaguri tehsil, 3,507 jotes.	162,063·39	By professional agency.	Acres. 330,483·20	Acres. 155,532·80(*a*)	Acres. 486,016	2,771	3,430	Rs. 2,15,325	Rs. 32,226	Rs. 1,10,784(*b*)	Rs. 30,459	Rs. 3,26,109	Rs. 62,685	...	...	Rs. A. P. 36,210 1 4	Rs. 60,000	

In column 3 the name of the estate is given. The estate is divided into four tehsils, viz., Mynaguri, Falakata, Alipore, and Bhalka, for the easy collection of Government revenue.
In column 4 is given 3,507 jotes of Mynaguri tehsil which have come under settlement. There are other jotes in this tehsil which have not been settled as yet for want of records from the Survey Department.
In column 5 the area shewn is that of only 3,507 jotes which were assessed during the year.
Columns 18 and 19 have not been filled, as the entire area of jotes and khas land in Mynaguri tehsil is not yet known as the survey is not completed.
Note.—(*a*) According to Survey Department 140,712, revision survey 9,508.
(*b*) The expenditure during the year according to Captain Hodgson is Rs. 1,03,568.

M. F.

APPENDIX.

Statement showing progress made in Government Estates and Temporarily-settled Tracts in record of rights and settlement of rents up to the 30th September 1891.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which record of rights has been completed—		Total number of raiyats in the village in column 4.	Number of raiyats whose rents had been recorded and status determined—			Total rent of tenants whose rents have been settled.				Remarks.
				Up to 30th September 1890.	During the year under report.		Up to 30th September 1890.	During the year under report.	Total of columns 8 and 9.	According to new settlement.	According to previous jummabandi.	Increase.	Decrease.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rajshahi...	Jalpaiguri ...	Western Duars Government estate.	Mynaguri tehsil, 3,507 jotes.	Nil	1,192	16,979	Nil	16,979	16,979	Rs. A. P. 70,627 0 0	Rs. A. P. 34,416 14 8	Rs. A. P. 37,334 2 0	Rs. A. P. 1,124 0 8	

In column 6 information is given as to jotes which were assessed during the year and of which revenue payable was announced to the jotedars.
In column 7 is given the entire number of tenants of 3,507 jotes which were assessed after inspection (*see* paragraph 10 of the report).

APPENDIX.

Statement showing the number of Jotes assessed in the Mynaguri Tehsil during the year commencing October 1890. *and ending September* 1891, *together with the old and new Assessment.*

Division.	District.	Name of tehsil.	Total number of jotes in the tehsil.	Number of jotes assessed— Up to 30th September 1890.	Number of jotes assessed— During period under report.	Total.	Number of tenants assessed.	Number of jotedars.	Number of chukanidars.	Total rental of tenants whose rents had been settled— According to settlement.	Total rental of tenants whose rents had been settled— According to previous jamabandi.	Increase.	Decrease.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rajshahi	Jalpaiguri	Mynaguri	3,507	Nil	3,507	3,507	16,979	11,890	5,089	Rs. 70,627	Rs. A. P. 34,416 14 8	Rs. A. P. 37,334 2 0	Rs. A. P. 1,124 0 6	

The figures in columns 11 to 14 refer only to 1,192 jotes out of 3,507 jotes shewn in column 6. Although the revenue was assessed for the remaining jotes before 30th September 1891, it was not announced to the jotedars within the year as explained in paragraph 10 of the Annual Report; hence the figures for 1,192 jotes only have been given in columns 11 to 14.

APPENDIX.

Statement showing the Estates under Survey and Settlement of Revenue during the half-year ending 30*th September* 1891.

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency	Area Surveyed. Up to 31st March 1891.	Area Surveyed. During the half-year under report.	Area Surveyed. Total area surveyed.	Number of villages of which records have been handed over by the Survey to the Settlement Officer. Up to 31st March 1891.	Number of villages of which records have been handed over by the Survey to the Settlement Officer. During the half-year under report.	Total cost up to— 31st March 1891. Survey.	Total cost up to— 31st March 1891. Settlement.	Total cost up to— During the half-year under report. Survey.	Total cost up to— During the half-year under report. Settlement.	Total cost up to— Total. Survey.	Total cost up to— Total. Settlement.	Rate per acre. Survey.	Rate per acre. Settlement.	Increase of revenue. Actually obtained.	Increase of revenue. Expected.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Rajshahi...	Jalpaiguri...	Western Duars Government Estate.	Mynaguri tehsil, 3,507 jotes.	Acres. 162,063·39	By professional agency.	Acres. 452,300·80	Acres. 33,715·20	Acres. 486,016	4,303	1,898	Rs. 3,02,698	Rs. 46,302	Rs. 23,411	Rs. 16,383	Rs. 3,26,109	Rs. 62,685	...	...	Rs. A. P. 36,210 1 4	Rs. 60,000	

In column 5 the area shown is that of only 3,507 jotes of the Mynaguri tehsil. Columns 18 and 19 have not been filled, as the entire area of jotes and khas land in Mynaguri tehsil is not yet known, as the survey is not completed.

APPENDIX.

Statement showing progress made in Government Estates and Temporarily-settled Tracts in record of rights and settlement of rents up to 30th September 1891.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which record of rights has been completed—		Total number of raiyats in the villages in column 4.	Number of raiyats whose rent had been recorded and status determined—			Total rental of tenants whose rents have been settled.				Remarks.
				Up to 31st March 1891.	During half year under report.		Up to 31st March 1891.	During the half year under report.	Total of columns 8 and 9.	According to new settlement.	According to previous jamabandi.	Increase.	Decrease.	
	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rajshahi ...	Jalpaiguri...	Western Duars Government Estate.	Mynaguri tehsil, 3,507 jotes.	Nil	1,193	16,979	Nil	16,979	16,979	Rs. 70,627	Rs. A. P. 34,416 14 8	Rs. A. P. 37,334 2 0	Rs. A. P. 1,124 0 8	

In column 6 information is given as to jotes which were assessed during the year and of which revenue payable was announced to the jotedars.
In column 7 is given the entire number of tenants of 3,507 jotes which were assessed after inspection (see paragraph 10 of the report).

APPENDIX J.

No. 6R, dated Calcutta, the 30th December 1891.

Memo. by—LIEUTENANT-COLONEL CHAS. STRAHAN, R.E., Deputy Surveyor-General in charge, Revenue Branch, Survey of India.

FORWARDED in original to the Director of the Department of Land Records and Agriculture, Bengal, for information, with reference to his No. 1818T.A., dated 10th November 1891.

REPORT ON CADASTRAL SURVEY WORK DONE IN DISTRICT JALPAIGURI (WESTERN DUARS) BY No. 4 PARTY IN SEASON 1890-91.

The cadastral survey of the Duars in season 1890-91 extended over the whole of the remaining jot land area in the Duars, including much of the cultivation carried on by the Mechis and others in the waste lands of pargana East Madari and the estate of the late Colonel Hidayat Ali. The accompanying tabulated statement shows in detail the area surveyed of which records were also prepared :—

PARGANA NAMES.	TALUK NAMES.	Number of chaks.	Number of jots.	Number of sheets.	Number of fields proper.	Number of additional kiaris.	Number of acres.	Number of square miles.
Chengmari ...	Chengmari, I portion ...	1	9	1	89	...	240 20	0 37
	Totogaon ..	1	5	2	43	...	441 35	0 69
	Total ...	2	14	3	132	...	681 55	1 06
North Mainaguri	Dhupjhora ...	...	4	...	67	...	52 17	0 08
	Khuriar Bandar ...	20	97	18	1,483	874	3,339 35	5 22
	Total ...	20	101	18	1,550	874	3,391 52	5 30
Moraghat ...	Angarbhasha ...	2	73	12	493	55	2,665 34	4 16
	Chapaguri ...	1	7	1	126	74	237 48	0 37
	Dudumarikolabari ...	3	34	4	143	...	1,579 52	2 47
	Gairkhuta ...	11	217	16	1,875	69	4,902 49	7 66
	Jhar Salbari ...	1	60	3	3,810	1,609	1,582 82	2 47
	Jurapani ...	2	17	2	2,675	1,416	799 77	1 25
	Khairkata ...	8	102	9	1,167	295	3,590 25	5 61
	Sakhujhora ...	1	61	5	589	38	2,243 37	3 51
	Salbari ...	3	21	1	1,970	730	697 30	1 09
	Salbari II ...	2	96	3	2,215	654	3,143 96	4 91
	Total ...	34	688	56	15,063	4,940	21,442 30	33 50
Lakhipur ...	Dalgaon Saragaon ...	64	493	71	17,486	4,080	23,532 00	36 77
	Dhulagaon ...	5	69	7	2,734	483	2,054 81	3 21
	Guabar ...	17	147	15	9,302	1,286	3,662 80	5 72
	Kathalbari ...	7	65	10	8,950	2,315	4,156 70	6 50
	Total ...	93	774	103	38,472	8,164	33,406 31	52 20
Madari west ...	Beltoli Bhandani ...	2	36	5	1,306	94	2,054 30	3 21
	Jhar Beltoli ...	2	16	2	870	155	645 77	1 01
	Total ...	4	52	7	2,176	249	2,700 07	4 22
Madari east ...	Patlakhawa ...	3	11	6	300	11	2,574 07	4 02
	Salkumar east ...	10	13	10	1,149	304	3,968 19	6 20
	Total ...	13	24	16	1,449	315	6,542 26	10 22
	Carried over ...	166	1,653	203	58,842	14,542	68,164 01	106 50

Pargana Names.	Taluk Names.	Number of chaks.	Number of jots.	Number of sheets.	Number of fields proper.	Number of additional kiaris.	Number of acres.	Number of square miles.
	Brought forward ...	166	1,653	203	58,842	14,542	68,164 01	106 50
Chakwakheti ...	Chakwakheti ...	2	3	9	139	15	718 59	1 12
	Satali Mendibari ...	11	47	16	3,642	2,310	6,391 27	9 99
	Topsikhata ...	...	3	...	128	...	873 07	1 36
	Total ...	13	53	25	3,909	2,325	7,982 93	12 47
Baxa ...	Banchukamari ...	4	9	6	472	...	1,861 56	2 90
	Barochauki ...	4	114	7	2,946	1,748	2,387 08	3 73
	Chaprerpar ...	4	35	7	3,311	2,391	2,615 84	4 09
	Chalnipak ...	3	16	4	1,780	475	1,755 51	2 74
	Chengpara ...	1	2	1	441	213	395 49	0 62
	Dhalkar ...	3	21	4	474	193	905 78	1 42
	Jitpur ...	1	1	2	17	...	36 88	0 06
	Nimtar Domohani ...	3	6	6	1,955	...	2,515 44	3 93
	Patkapara ...	8	12	12	451	31	4,331 78	6 77
	Salsalabari ...	1	5	1	377	132	477 19	0 75
	Ghagra ...	...	1	...	2	...	22 26	0 03
	Notobari ...	...	1	...	404	...	129 55	0 20
	Total ...	32	223	50	12,630	5,183	17,435 36	27 24
Bhatibari ...	Bhatibari ...	6	128	8	7,942	1,549	3,056 91	4 78
	Bendipara ...	1	51	1	1,030	144	451 11	0 70
	Burujirkuta ...	2	27	2	416	208	770 54	1 20
	Chankirbash ...	7	11	8	1,762	1,479	3,279 02	5 12
	Chepani ...	8	110	10	4,890	1,131	4,672 91	7 30
	Chikliguri ...	8	40	8	3,817	1,173	3,114 88	4 87
	Chilarghat ...	1	20	1	902	265	313 14	0 49
	Karjespara ...	1	93	3	2,165	869	1,286 65	2 01
	Khalisamari ...	4	61	4	1,255	144	1,879 90	2 94
	Koyakhata ...	1	34	1	987	311	593 10	0 93
	Kumarijaon ...	3	32	3	2,253	533	1,283 28	2 00
	Mahakalguri ...	5	5	5	1,470	47	2,231 09	3 49
	Masjidkhana ...	4	99	5	3,610	603	2,232 53	3 49
	Parokata ...	4	89	6	1,610	255	2,184 36	3 41
	Sandpara ...	3	110	3	2,666	547	945 02	1 48
	Sebkata Usuibari ...	5	5	4	684	2,112	870 29	1 36
	Talesharguri ...	2	2	3	310	...	627 54	0 98
	Thanupara ...	2	51	2	1,718	460	997 88	1 56
	Totopara ...	3	69	3	2,432	993	1,116 43	1 74
	Khatopara ...	...	3	...	58	...	45 15	0 07
	Total ...	71	1,040	80	41,977	12,843	31,951 73	49 92
Bholka ...	Barobisa ...	1	6	1	643	885	165 03	0 26
	Bholka ...	4	70	4	3,291	1,621	1,244 75	1 94
	Chakchaka ...	1	40	2	2,090	423	1,027 24	1 61
	Chhotaguna ...	4	20	4	1,408	287	953 50	1 49
	Duldulli ...	7	74	10	7,464	10,477	3,505 66	5 48
	Haldibari ...	8	145	8	3,842	8,714	3,000 75	4 69
	Kamakhaguri ...	2	4	3	75	8	234 83	0 37
	Kumargaun ...	6	183	8	8,900	18,298	3,624 28	5 66
	Majher Dabri ...	7	45	7	1,638	646	3,366 52	5 26
	Morakhata ...	1	6	1	878	...	329 00	0 51
	Naratoli ...	6	14	7	721	389	1,691 80	2 64
	Paglarhat ...	1	17	3	723	220	858 96	1 34
	Pukrigaon ...	2	41	2	1,900	2,910	645 32	1 01
	Chengmari ...	8	98	10	7,787	10,724	3,530 01	5 52
	Total ...	58	763	70	41,360	55,602	24,177 65	37 78
	Grand Totals of areas, &c., both surveyed and khanapuried in season 1890-91 ...	340	3,732	428	158,718	90,495	149,711 68	233 91

In addition to the above, the records only of the area included in the taluks, &c., mentioned in the following tabulated statement were written in the field. This area was surveyed

in season 1889-90, but owing to the advent of the rains at the close of the field season, it was found impracticable to have the work completed.

Areas, &c., of the portion of which only the khasra writing was done in season 1890-91.

Pargana Names.	Taluk Names.	Number of chaks.	Number of jots.	Number of sheets.	Number of fields proper.	Number of additional kiaris.	Number of acres.	Number of square miles.
Madari east ...	Patlakhawa ...	8	65	13	5,886	1,546	5,471 82	8 55
	Salkumar east ...	5	11	6	442	135	1,289 38	2 01
	Total ...	13	76	19	6,328	1,681	6,761 20	10 56
Chakwakheti ...	Kamsinghgaon ...	3	60	5	3,028	723	2,666 63	4 17
	Pachkalguri ...	1	26	1	1,199	614	724 81	1 13
	Pararpar ...	4	98	4	4,850	2,256	2,824 18	4 41
	Topsikhata ...	5	66	8	5,683	2,399	3,303 94	5 16
	Sonapur ...	2	22	2	680	...	871 72	1 36
	Total ...	15	272	20	15,440	5,992	10,391 28	16 23
Baxa ...	Bairiguri ...	...	22	...	478	...	444 70	0 69
	Banchukamari ...	...	3	...	120	...	83 96	0 13
	Chaprarpar ...	2	24	3	1,858	705	1,254 76	1 96
	Chengpara ...	1	4	2	1,111	1,004	660 85	1 03
	Dawanpui ...	3	51	4	1,669	197	2,257 04	3 53
	Ghagra ...	4	48	4	2,083	462	1,258 90	1 97
	Jitpur ...	2	5	2	702	227	360 28	0 56
	Majardabri ...	3	29	3	648	125	1,017 77	1 59
	Salsalabari ...	2	40	2	1,646	295	1,126 36	1 76
	Shubagung ...	1	4	1	784	332	459 58	0 72
	Total ...	18	230	21	11,099	3,347	8,924 20	13 94
Bhatibari ...	Karipara ...	1	10	1	572	143	259 71	0 41
	Khotopara ...	1	62	1	875	179	355 48	0 55
	Total ...	2	72	2	1,447	322	615 19	0 96
	Grand Totals of areas of which khasras only were prepared	48	650	62	34,314	11,342	26,691 87	41 69

Besides the foregoing, at the special request of the Settlement Officer and with the sanction of the Deputy Surveyor-General, the survey of a portion of the land adjoining the river Tista, which had been subjected to the action of the river during the heavy rains of 1890, and had been partly cut away or silted over, was revised and the limits of the silting over shown on the tracing and the records corrected in accordance with it. Also in taluk Char Churabandar where land was allotted and changes made in the boundaries subsequent to survey, a complete revision survey was made of the entire taluk and the records changed The subjoined area statement shows the extent of the survey made under both heads.

Areas of the portion revised at the request of the Settlement Officer with the sanction of the Deputy Surveyor-General.

Pargana Name.	Taluk Name.	Number of chaks.	Number of jots.	Number of sheets.	Number of field proper.	Number of additional kiaries.	Number of acres.	Number of square miles.
South Mainaguri ...	Char Churabandar ...	...	90	...	1,152	...	1,645 80	2 57
	Domohani, Marichbari and Sesuabari.	...	40	...	6,099	...	2,007 62	3 14
Chengmari ...	Basu Suba, Maumari, Premgung and Sangapara.	...	79	...	9,244	...	5,802 02	9 07
North Mainaguri ...	Khuriar Bandar ...	...	3	...	102	...	52 31	0 08
	Total ...	...	212	...	16,597	...	9,507 75	14 86

The area left for survey within the limits originally assigned for cadastral operations consists of about 6 square miles, and comprises a portion of taluk Dudeemari Kolabari, in pargana Moraghat, which was omitted last season in consequence of imperfect demarcation and inability on the part of the jotdars to point out their boundaries. A portion of taluk Gairkhuta, consisting of 17 jots, the existence of which, owing to want of information

at time of survey and to the jots being only grass plots imperfectly demarcated, was not known till too late for their being taken in hand and completed before the rains. A few jots in taluk Cheknakheti which, owing to an outbreak of cholera and the death of two field surveyors, had to be left unfinished, and a small area of scattered cultivation in taluk Salkumar, east, which could not be completed before the advent of the rains. In addition to this, owing to the reported omissions of cultivated land in taluk Udlabari, an area of about 600 acres has been included in the work of the present field season: this has already been surveyed. It has now been ascertained that 200 acres of land are not under cultivation as was reported, but only about 80 acres, and of these 27 acres, it is said, will be resumed by the Settlement Officer as soon as the crops are cut, as the land is covered with valuable timber and the cultivation is quite new. Fourteen jots of taluk Borodighi, newly allotted in grass jungle, remain to be taken up, and a few isolated jots incorporated in the tea lands, and which for want of previous information had been looked upon as part of the tea lands, and hence omitted from survey have, at the request of the Settlement Officer, been put in hand and are now being surveyed. The cultivated area found in taluk Jaigaon will also shortly be given out for survey.

The number of records despatched to the Settlement Officer during the season up to 30th September is given in the accompanying tabulated statement.

District Jalpaiguri.

Months.	Records of seasons 1888-89-90.				Records of season 1890-91.			
	Number of misls.	Number of fields.	Area in— Acres.	Area in— Square miles.	Number of misls.	Number of fields.	Area in— Acres.	Area in— Square miles.
October 1890	21	2,416	1,545 30	2 41	...	...	...	...
November ,, ...	210	13,937	6,220 80	9 72	...	...	...	...
December ,, ...	240	18,027	12,455 26	19 45	...	...	...	...
January 1891	226	15,324	10,748 85	16 80	...	...	...	...
February ,, ...	229	12,153	8,979 30	14 03	...	...	...	...
March ,, ...	606	26,632	9,363 20	14 63	...	...	...	...
April ,, ...	279	15,780	11,539 20	18 03	61	457	1,673 81	2 62
May ,, ...	114	18,153	9,216 96	14 40	...	...	...	...
June ,, ...	187	12,201	10,825 19	16 91	...	...	...	...
July ,, ...	401	37,119	31,769 60	49 64	99	1,441	3,260 59	5 09
August ,, ...	133	5,476	5,006 20	7 82	316	4,104	8,499 65	13 28
September ,, ...	91	8,358	5,778 39	9 03	217	1,917	8,086 03	12 63
Total ...	2,737	185,603	123,448 25	192 87	693	7,919	21,520 08	33 62
Remaining ...	859	32,957	41,228 25	64 42	3,754	185,113	154,883 47	241 98

The following statement shows the number of jots by taluks, the records of which have been despatched to the Settlement Officer to date and those that remain to be sent away :—

Serial number.	Name of pargana.	Name of taluk.	Number of jots.	Despatched to Settlement Officer.	In hand.	Remarks.
	Ambari Falakata ...	Ambari Falakata ...	42	42	...	
			42	42	...	
1	South Mainaguri ...	Bagjan ...	13	13	...	
		Bangalarjhar ...	48	48	...	
		Baragharia, I ...	34	34	...	
		Ditto II ...	16	16	...	
		Baragila, east ...	16	16	...	
		Ditto west ...	34	34	...	
		Baulbari ...	39	39	...	
		Bengkandi ...	29	29	...	
		Betgara ...	51	51	...	
		Bhangamali ...	31	31	...	
		Bhuskadanga, I ...	35	35	...	
		Ditto II ...	3	3	...	
		Bedurerdanga ...	13	13	...	
		Bromahpur ...	47	47	...	
		Chapger ...	44	44	...	
		Char Churabandar ...	90	90	...	
		Carried over ...	543	543	...	

Serial number.	Name of pergunnah.	Name of taluk.	Number of jots.	Despatched to Settlement Officer.	In hand.	Remarks.
		Brought forward ...	543	543	...	
1	South Mainaguri—*concluded.*	Chatrarpar ...	36	36	...	
		Churabhandar ...	52	52	...	
		Dangapara, I ...	17	17	...	
		Ditto II ...	25	25	...	
		Darikamari ...	54	54	...	
		Domohani ...	23	23	...	
		Gartoli ...	17	17	...	
		Gorgram ...	27	27	...	
		Haramoti ...	50	50	...	
		Jhar Barogila ...	259	259	...	There were several jots demarcated subsequent to survey which had not been taken up by the Survey Department, as it was understood that the Settlement Department would deal with them.
		Jhar Matiali ...	45	45	...	
		Kathalbari ...	25	25	...	
		Khagrabari ...	46	46	...	
		Khairkhal ...	34	34	...	
		Madhudanga ...	52	52	...	
		Mainaguri ...	10	10	...	
		Marichbari, I ...	32	32	...	
		Ditto II ...	9	9	...	
		Matiali ...	128	128	...	
		Maumari ...	35	35	...	
		Parbadehar ...	16	16	...	
		Putimari, I ...	6	6	...	
		Ditto II ...	56	56	...	
		Salbari ...	33	33	..	
		Singimari ..	40	40	...	
		Siswabari I ...	36	36	...	
		Ditto II ...	5	5	...	
		Ditto III ...	29	29	...	
		Ditto IV ...	5	5	..	
		Ulladabari, I ...	30	30	...	
		Ditto II ...	27	27	...	
			1,802	1,802		
	Chengmari ...	Basusuba ...	31	31	...	
		Chapadanga ...	24	24	...	
		Chengmari, I ...	136	136	...	
		Ditto II ...	27	27	..	
		Dalaigaon ...	35	35	...	
		Hanskhali ...	153	153	...	
		Jhar Majhgaon ...	14	14	...	
		Khalpara ...	51	51	...	
		Majhgaon ...	59	59	...	
		Manmari ...	28	28	...	
		Phulbari ...	84	84	...	
		Premgung ...	54	54	...	
		Rajadanga ...	207	207	...	
		Sangapara ...	26	26	...	
		Saripakri ...	63	63	...	
		Totogaon ...	36	36	...	One jot demarcated subsequent to survey now being surveyed.
		Udlabari ...	146	146	...	There are some jots allotted and demarcated subsequent to survey which are now in hand (season 1891-92.)
			1,174	1,174		

Serial number.	Name of pergunnah.	Name of taluk.	Number of jots	Despatched to Settlement Officer.	In hand.	Remarks.
	North Maniaguri...	Barodighi ...	57	57	...	Several jots allotted and demarcated subsequent to survey remain to be taken up in 1891-92
		Damdim ...	117	117	...	
		Dhubjhora Tendu ...	111	111	...	
		Haihaipathar ...	454	454	...	
		Kantodighi Kumarpara	146	146	...	
		Khuriar Bandar ...	161	161	...	
			1,046	1,046		
	Moraghat ...	Altagram ...	84	84	...	
		Angarbhasha ...	110	104	6	Boundaries disputed.
		Barogharia ...	87	87	..	
		Boratiguri ...	24	24	...	
		Boragari ...	89	89	...	
		Chapaguri ...	7	7		
		Dudumari ...	34	34	...	Several jots omitted for want of demarcation will be surveyed 1891-92.
		Gadong ...	88	88	...	
		Gadiarkhuti ...	8	8	...	
		Gairkhuta ..	344	344	...	Several jots allotted in waste lands exterior of Mn. Ct. to be surveyed in season 1891-92.
		Gusairhat ...	54	54	...	
		Jakaikona ...	3	3	...	
		Jhar Altagram ...	340	340	...	
		Jhar Magurmari ...	27	27	...	
		Jhar Salbari ...	70	70	...	Despatched in October 1891 only 6 1 jotes.
		Jurapani ...	17	17	...	Ditto ... 1891.
		Khairkhata ...	110	110	...	
		Khulaigram ...	43	43	...	
		Magurmari ...	20	20	...	
		Pundibari ...	11	11	...	
		Sakhujhora ...	169	169	...	Despatched in October 1891.
		Salbari, I ...	119	119	...	
		Ditto II ...	105	105	...	Despatched in October 1891 only jots.
		Tendu ...	132	132	...	
			2,095	2,089	6	
	Lakhipur ...	Balasundar ...	24	24	...	
		Baraduba ...	11	11	..	
		Bhutuarghat ...	37	37	...	
		Dalgaon Sarugaon ...	493	...	493	
		Dholagaon ...	69	...	69	
		Goabar ...	148	148	...	Despatched in November 1891
		Kathalbari ..	67	67	...	Ditto.
		Kherarkot ...	9	9	...	
			858	296	562	
	Madari, West ...	Beltoli Bhaudani ...	65	...	65	
		Deogaon	130	130	...	Despatched in October 1891.
		Jhar Beltoli Bhaudani	16	...	16	
		Parangarpar ...	360	.	360	
		Raichanga ...	53	53	...	
		Salkumar ...	173	...	173	
			797	183	614	
	Madari, East ...	Patlakhawa ...	129	...	129	
		Salkumar, East ...	24	...	24	
			153	...	153	

Serial number.	Name of pergunnah.	Name of taluk.	Number of jot.	Despatched to Settlement Officer.	In hand.	Remarks.
	Chakuakheti ...	Chakuakheti ...	3	...	3	
		Kamsinggaon ...	60	...	60	
		Pachkalguri ...	26	...	26	
		Pararpar ...	98	...	98	
		Satali ...	47	...	47	
		Sonapur ...	34	...	34	
		Topsikhata ...	69	...	69	
			337	...	337	
	Baxa ...	Bairiguri ...	22	...	22	
		Banchukamari ...	12	...	12	
		Barochauki ...	114	...	114	
		Chaluipak ...	16	...	16	
		Chugpara ...	6	...	6	
		Chaprarpar ...	59	...	59	
		Damanpur ...	51	...	51	
		Dhalkar ...	21	...	21	
		Ghagra ...	49	...	49	
		Jitpur ...	6	...	6	
		Lotabari ...	1	...	1	
		Majherdabri ...	29	...	29	
		Nimtardomdhani ...	6	...	6	
		Patkapara ...	12	...	12	
		Salsalabari ...	45	...	45	
		Shubaganj ...	4	...	4	
			453	...	453	
	Bhatibari ...	Bhatibari ...	128	...	128	
		Bindipara ...	51	...	51	
		Burujirkuta ...	27	...	27	
		Chaukurbash ...	11	...	11	
		Chipani ...	110	...	110	
		Chikliguri ...	40	...	40	
		Chilarghat ...	20	...	20	
		Karepara ...	10	...	10	
		Kajipara ...	93	...	93	
		Khalsamari ...	61	...	61	
		Khatopara ...	65	...	65	
		Koyakhata ...	34	...	34	
		Kumarigan ...	32	...	32	
		Mahakalguri ...	5	...	5	
		Masjidkhana ...	99	...	99	
		Parokata ...	89	...	89	
		Sandpara ...	110	...	110	
		Sebkata ...	5	...	5	
		Taleshwarguri ...	2	...	2	
		Thampara ...	51	...	51	
		Totopara ...	69	...	69	
			1,112	...	1,112	
	Bholka ...	Barobisa ...	6	...	6	
		Bholka ...	70	...	70	
		Chakchaka ...	40	...	40	
		Chengmari ...	98	...	98	
		Chotagooma ...	20	...	20	
		Carried over ...	234	...	234	

Serial number.	Name of pergunnah.	Name of taluk.	Name of jot.	Despatched to Settlement Officer.	In hand.	Remarks.
		Brought forward ...	234	...	234	
		Duldulli ...	74	...	74	
		Haldibari ..	145	...	145	
		Kamkhaguri ...	4	...	4	
		Kumargaon ...	183	...	183	
		Majherdabri ...	45	...	45	
		Naratoli ...	14		14	
		Paglarhat ...	17	...	17	
		Pukrigaon ...	41	...	41	
		Morakhota ...	6	...	6	
			763	...	763	

Abstract.

No.	Name of pergunnah.	No. of taluks.	No. of jots.	Despatched to Settlement Officer.	In hand.	Remarks.
	Ambari Falakata ...	1	42	42	.....	* Exclusive of the 181 jots revised and submitted a second time and so included in the return.
	South Mainaguri ...	47	1,802	1,802	.....	
	Chengmari ...	17	1,174	1,174	.....	
	North Mainaguri ...	6	1,046	1,046	.....	
	Moraghat ...	24	2,095	2,089	6	† These figures differ to a slight extent from those given in the Progress Report. Those in the latter are only approximate, and changes are constantly being made as plots of khas are added to or taken from taluks.
	Lakhipur ...	8	858	296	562	
	Madari, West ...	6	797	183	614	
	Madari, East ...	2	153	.....	153	
	Chakwakheti ...	7	337	.....	337	
	Baxa	16	453	.....	453	
	Bhatibari ...	21	1,112	.....	1,112	
	Bholka ...	14	763	.....	763	
	Grand Total ...	169	10,632	6,632*	4,000†	

The total cost of cadastral operations during the survey year has been Rs. 1,03,658, which should be apportioned as follows:—Permanent marks Rs. 1,897, detail survey Rs. 41,210, revision survey Rs. 1,790, khanapuri Rs. 10,888, office records Rs. 23,186, 16″ mapping and area computation Rs. 24,571, instruction of Bengalies Rs. 116.

The cost rates deduced from the foregoing are as follows:—

	Per square mile.	Per acre.	Per field.
Permanent marks	5·8	...	...
Detail survey 16″	176·1	4·4	2·6
Revision survey	12·0	...	...
Khanapuri	39·8	0·9	0·6

The sickness both during the field season and recess has been very severe and has retarded progress most materially. The experienced draftsmen and estimators of the office cannot be readily replaced, and several have left—in fact have been compelled to leave—in consequence of the severe illness from which they have been continuously suffering, and more are on the point of going away.

An index map showing the extent of work done in district Jalpaiguri is attached.

H. J. HANBY,

Surveyor in Charge Cadastral Camp,

No. 4 Party, Western Duars.

APPENDIX K.

No. 8T, dated Camp Daulatkhan, the 31st December 1891.

From—H. SAVAGE, Esq., Offg. Collector of Backergunge,

To—The Director of the Department of Land Records and Agriculture, Bengal.

I HAVE the honour to submit a settlement report for the Backergunge district for the year beginning 1st October 1890 and ending 30th September 1891.

2. *Wards estates under survey and record of rights.*—One estate, called the Dakhin Shabázpur estate, which is situated in the island of Bhola.

3. The pargana of Dakhin Shabázpur comprises two estates, of which the numbers on the revenue roll of the district are 1763 and 1764. The estate 1763, which is under the Court of Wards, and which was the estate in which survey and record of rights were in progress during the year under report, is made up of (*a*) seven annas share of the land of the pargana of which the greater part was separated from the 9 annas share by a partition made before the Permanent Settlement, a small portion being, however, left ijmáli, and (*b*) 5*a*. 18*g*. 1*k*. 2*kr*. out of the 9 annas share. This 5*a*. 18*g*. 1*k*. 2*kr*. share was purchased by the proprietors of the 7 annas subsequent to the partition of the land between the 7 annas and 9 annas shares. There has never been any partition of the lands of this 5*a*. 18*g*. 1*k*. 2*kr*. share from the lands allotted to the 9 annas share in the partition made previous to the Permanent Settlement, and hence it follows that the proprietors of estate 1763 possess rights which extend over the whole land of the pergunnah.

4. The operations for the survey and record of rights of this estate 1763 commenced in December 1889, and from the commencement down to 30th September 1890 the work which had been done is shown below as accurately as I am able to give it.

5. A professional survey party under the orders of Colonel Steel arrived on the estate in December 1889, and remained there up to the following June. They were engaged in the survey of the Dakhin Shabázpur ward's and of Government estates in Backergunge at the same time. The work done in the Dakhin Shabázpur estate was the following :—

(*a*) Traverse survey of the whole estate, the area of which was found to be 130·65 square miles, comprised in 38 villages.

(*b*) Cadastral survey of 36 of these villages, comprising an area of 124·56 square miles.

(*c*) Khanapuri (*i.e.*, filling up the first four columns of the khasra) with respect to 14 of the smallest villages in the estate comprising an area of only 17·58 square miles.

6. In June 1890 the party went into recess at Barrackpore, and I am unable to state what work was done by its members from that month up to the end of September 1890. All I know is that they were engaged in calculating areas, filling up remaining columns of the khasra, preparing khatians and terijes with respect to the 14 villages of which the khanapuri had been done on the field, inking up the maps, and preparing tracings of the maps for the Settlement Office.

7. The party stayed at Barrackpore until November, and probably were engaged in the above work up to that month, if not later ; but no statement has been sent to me to show what progress was made, or when the work was done, and the utmost I can state is that the survey party forwarded to the Settlement Officer in October 1890, khasra, khatian, terij, milan khasra, area and crop statements and tracings of maps with respect to four villages, and similar papers with respect to one village in November, five in January and four in May. The records of these last four and of one of the five of which records were sent in January were found to be incomplete, as the names of intermediate tenure-holders had been omitted and some of the papers were missing, so that a revision of the whole of khanapuri work connected with these five villages became necessary. The nine villages of which the papers were received in a complete form from the professional party cover an area of 5·38 square miles only.

8. In the absence of any information as to what the party did in each month of the period from June 1890 to May 1891, I think it probably will be best to regard the recess work of the party as far as this estate is concerned, as completed before 30th September 1890, since only by doing this that I can furnish any figures as to cost of the operations up to the end of September 1890.

9. The total cost of the work done in this estate by the survey party as reported by Colonel Strahan in his letter No. $\frac{738}{R\ 50\text{-}75}$, dated 6th November 1891, to your address, is Rs. 36,045-7. No particulars whatever have been supplied to show how this sum was arrived at, or how much should be regarded as cost of traverse survey, cadastral survey, khanapuri. or record writing.

* The Deputy Superintendent of the second party (*i.e.*, the party which was at work in this estate), in a letter No. $\frac{292}{M}$, dated 19th June 1891, gave the Settlement Officer the

* This has formed the subject of correspondence, the result of which will probably be that the amount charged by the Survey Department to the Dakhin Shahbázpur estate will have to be reduced. The Collector estimates that the amount properly debitable to these estates is Rs. 25,278½.

following figures for the work done, both in the Government estate on the island of Dakhin Shabázpur and in this estate :—

	Rs.	A.	P.
Traverse survey of 285·9 square miles	9,377	13	5
Embedding stones on the traverse lines	3,023	0	8
Cadastral survey of 171·35 square miles	19,831	1	11
Khanapuri and completion of records over 59 square miles	15,115	5	7
Total ...	47,347	5	7

But this total is Rs. 2,539-1-5 less than the total given by Colonel Strahan (Rs. 49,886-7) for the work on both the Government estates and this estate.

10. The question as to which figure is correct will form the subject of separate correspondence. For the purpose of the present report I however assume that Colonel Strahan's figures are correct, and, as it seems probable, that the mistake in the Deputy Superintendent's figures is in the item of khanapuri and completion of records, the work which was done last, and of which the accounts must have been made up more hurriedly than the account of the other works which were completed a full year before the figures were given by the Deputy Superintendent. I assume that the figures of the Deputy Superintendent under the head Khanapuri, &c., should be increased by Rs. 2,539-1-5, from Rs. 15,115-7 to Rs. 17,654-7.

11. The professional party did not, as far as I am aware, attempt to keep up any separate account of expenditure on account of the Government estates and this estate, and if there be no separate account, I presume the distribution of the total cost (Rs. 49,886-7) between the Government estates and this estate can only be made equitably on the principle of charging each item in proportion to area over which the work extended. Adopting this plan, however, the sum which I find should be charged against this estate is much less than the sum named by Colonel Strahan. The basis and result of my calculation I give below : —

	Area			Total cost.	Share of this estate.	Remarks.
	Government estates.	Estate 1763.	Total.			
	Sq. m.	Sq. m.	Sq. m.	Rs. A. P.	Rs. A. P.	
Traverse ...	157·46	130·65	288·11*	9,377 13 5	4,231 6 9	* The Deputy Superintendent gives total area 285·9. This is a mistake.
Stone embedding ...	157·46	130·65	288·11	3,023 0 8	1,370 13 10	
Cadastral ...	46·79	124·56	171·35	19,831 1 11	14,416 12 5	
Khanapuri and records.	41·42	17·58	59·00	17,654 7 0	5,260 7 0	
					25,278 8 0	

12. In this way I arrive at Rs. 25,278-8 as the amount chargeable against this estate as against Colonel Strahan's figures Rs. 36,045-7, and although in the return accompanying this report I adopt Colonel Strahan's figures, these figures will most probably have to be revised in the near future.

13. Accepting Colonal Strahan's figures, and assuming the professional party completed their work by 30th September 1890, it follows that the cost incurred by the members of that party for the whole of their operations described above was Rs. 36,045-7—all for survey.

14. The Settlement Officer joined his appointment on 21st December 1889, but as he was at the same time employed on settlement work in the Government estate, only two-thirds of his pay and allowances and cost of establishment is chargeable against this estate from that date up to 30th September 1890 (*vide* Government order conveyed in their letter No. $\frac{4227}{1599}$L.R. of 29th December 1890, to the address of the Secretary to the Board of Revenue). This two-thirds as calculated by the Settlement Officer comes to Rs. 3,227-10, and this is shewn as a settlement charge, though actually no settlemant work was done in that period, as no records were made over to the Settlement Officer, who, however, was usefully employed in smoothing the way for the survey party in reconciling differences which arose between the survey amíns (up-country men) and the tenants and in supervising and testing the khanapuri work of these amíns.

15. The above I have thought it proper to place on record in order to allow of a clear report regarding the operations in the year under review, to which I now turn.

16. On the 1st October 1890 the work which remained to be done was—

(A) Cadastral survey of ·24 square miles.

(Note.—There was an area of 5·85 square miles "char" land of which cadastral survey was not needed ; hence difference between area by traverse and area by cadastral survey.)

(B) Khanapuri and record writing, inclusive of inking in and completing the maps estimating area, and preparation of tracings of 24 villages covering area of 107·22 square miles.

(C) The settlement work of the whole estate.

(D) The preparation of copies of records for the tenants and the Collector.

17. Within the year 1st October 1890 to 30th September 1891, the work actually done by the Settlement Officer was—

(A) Cadastral survey of 24 square miles.

(B) Khanapuri, inking in and completion of maps, estimating of area completed for the 24 villages noted above. Record writing completed for 13 villages out of the 24 (area of the 13 being 33·08 square miles).

For the other villages khatians and terijes were partly written, but the Settlement Officer cannot give me the exact amount remaining to be done on 1st October 1891. Tracings prepared of maps of 23 villages out of the 24.

(C) The settlement work done in the year was as follows :—

(*a*) Attestation and record of rents completed in 11 villages covering an area of 14·49 square miles.

(*b*) First publication of records made with respect to 6 villages covering area of 2·09 square miles.

(*c*) Final publication made with respect to 3 villages covering area of ·30 square miles.

(*d*) Number of tenants whose rights have been recorded and status determined is 8,067. This is the number of tenants in the 11 villages (*a*).

(*e*) One hundred and twenty-one suits (99 for settlement of fair rents with respect to 590 tenants, and 22 suits on other questions) disposed of. Forty-two boundary disputes and 114 miscellaneous petitions of objection were also diposed of. Besides the Settlement Officer also claims that he disposed summarily of a large number of verbal objections of which the only record is the corrections made in the records when such were found to be needed.

(D) Collector's copies of records of the 3 villages (C) (*e*) were prepared.

18. The small outturn of settlement work is explained as follows :—

Records of 14 villages were received from the survey party. Of these 14 villages, one had been washed away completely by the river after the survey, and no settlement work was called for with respect to it. The records of 5 villages covering area of 12·20 square miles were received in such an incomplete state that it was found necessary to depute amins to revise them. (I have seen some of the papers and find the revision was absolutely necessary. This revision has been taken in hand since the close of the year under report.) The remaining 8 villages of which the records were received from the survey party are included in (C) (*a*) The 6 in (C) (*b*) and 3 in (C) (*e*) form part of these 8. The remaining 3 in (C) (*a*) are 3 villages of which the khanapuri and record writing were done during the year under review under supervision of the Settlement Officer. The records of other villages of which the khanapuri was made by him could not be got ready for attestation during the year.

19. The cost of the operations during the year is given by the Settlement Officer thus :—

	Rs.	A.	P.
Survey	8,141	5	6
Settlement	6,410	9	9

To survey he has charged only the extra establishment employed by him for the khanapuri and record writing. He has not charged to it any portion of his own pay. Of his own pay and allowances and of the pay of his settlement establishment he has charged two-thirds against this estate and one-third against Government estates from 1st October 1890 to 31st March 1891, according to Government order quoted above ; but from 1st April to 30th September 1891 he has debited the ward's estate with the whole cost in accordance with proposal made by me.

20. The work which remained to be done at the close of the year under review was—

Survey.

Completion of record writing of 11 villages.
Preparation of tracing of one village map.
Revision of records of 5 villages mentioned in paragraph 18.

Settlement.

Attestation and record of rights in 26 villages. (One being diluviated the total number of villages is now 37 only.)
First publication to be made in 31 villages.
Final publication in 34 villages.
Rights of 74,000 tenants to be recorded and status determined.

21. By the word "tenant" here is meant "person for whom separate khatian has to be prepared." For one person it is found necessary to prepare several khatians because of the extraordinary commingling of rights in the estate. At first it was estimated there would be only 24,150 tenants on the estate. This estimate was based on the number of tenants (*i.e.*, number of separate khatians required) in the few villages of which records had been at the time received from the survey party, but it now appears that party chose for their khanapuri the villages in which there were fewest complications, and the total number of khatians which have now (21st December) actually been prepared for 33 out of the 37 villages is 64,189, and adding the number (some 20,000) estimated for the remaining 4 villages, the total number comes in round numbers to 85,000.*

* This number (85,000) is for both the estates 1763 and 1764. The Settlement Officer, with my approval in anticipation of sanction, which has since been received, prepared records for both estates. He cannot at present give me the figures separately for each estate, but approximately one-fourth of the khatian may be for estate 1764.

22. The total cost of the work from commencement of operations to close of the year under review is on the figures as adopted in this report :—

	Rs.	A.	P.
Survey	44,186	12	6
Settlement	9,638	3	9

23. The sanctioned estimate for the survey and settlement together was Rs. 24,960 only (*vide* letter No. 338A, dated 10th April 1890, from Secretary to the Board of Revenue to your address). The excess amount already spent is due to the very expensive proceedings of the survey party.

24. For the work to be done under the Settlement Officer his estimate submitted to you in Calcutta and afterwards revised in his letter No. 71, dated 27th June 1891, to my address, and approved by you (*vide* your letter No. 1164 T. A. of 27th July 1891), is as revised :—

	Rs.
For survey	13,355
For settlement	13,325 (from 1st April 1891)

to which the sum Rs. 5961-14† expended before that date must be added as also sanctioned (*vide* paragraph 9 of your inspection memorandum dated 2nd June 1891), bringing total for settlement to Rs. 19,286-14.

† The figures given by Babu Pyari Mohan Bose at the time of the inspection in June 1891 was Rs. 3,632. This was a mistake. He calculated them on the basis which I had proposed of charging half only of his pay, &c., against this estate. Calculating it two-thirds as ordered by Government the amount is as shewn.

25. On account of survey to close of year under review the Settlement Officer spent only Rs. 8,141-5-6, and he will complete the work within the estimate.

26. On settlement he has expended to close of the year Rs. 9,638-8-9, which leaves now nearly Rs. 10,000 for completion of the work.

27. The settlement operations within the year under report have resulted in a net decrease of rents payable by Rs. 220-6-7. This, however, is but a nominal decrease. The villages of which the settlement work was completed had all more or less been subject to diluvion, and the rent-roll of these villages was practically a fictitious one, as many of the tenures and tenants named therein had disappeared.

28. Actually I find the Manager of the estate 1763, as far as his interest is concerned, was only able to realize from these three villages on an average Rs. 19-1-7 per annum, although his rent-roll for the villages was Rs. 292-3-1. Under the present settlement his rent-roll comes to Rs. 197-9-9, and as this sum will in future be easily realizable, the actual gain to the ward's estate is Rs. 178-8-2.

29. *Government estates.*—At the commencement of the year under report there were 48 Government estates under settlement in various parts of the district. Of these, 21 were under the old Regulations and 27 estates under settlement under the Tenancy Act.

1. Joynagar, No. 5285 in the file of Mr. Dutt.
2. Lamchipata, No. 5219 ditto.
3. Lamchi Koralmara, No. 6384 in the file of Babu P. M. Bose.
4. Kristo Prosad, No. 5257 ditto.
5. Bashan Lapta Madanpura, No. 5292 in the file of Subdivisional Officer of Bhola.
6. Char Koralmara, No. 5250 in the file of Babu P. M. Bose.
7. Char Umed, No. 5256 ditto.
8. Char Bhairab, No. 5281 in the file of Babu P. M. Bose, including
9. Char Price, 5302 ditto.
10. Char Lakshmi, No. 5243 ditto.
11. Lalmohan, No. 5245 ditto.
12. Lord Hardinge, No. 5249 ditto.
13. Char Kali, No. 5251 ditto.
14. Char Fasson, No. 6431 ditto.
15. Char Drummond, No. 5305 ditto.
16. Char Uday Kali, No. 5262 ditto.
17. Char Padma, No. 5234 ditto.
18. Char Shambupura, No. 5225 ditto.
19. Golakpura, No. 5226 ditto.
20. Char Madhupura, No. 5215 in the file of Subdivisional Officer of Bhola.
21. Bairagya, No. 5216 ditto.
22. Gonespura, No. 5221 ditto.
23. Char Jangla, No. 4748 ditto.
24. Char Kala Chand, No. 5280 ditto.
25. Char Badan, No. 4697.
26. Char Sitaram, No. 5196.
27. Chandrail, No. 6277.

30. *Estates under survey and settlement under the Tenancy Act.*—The 27 estates as noted on the margin are all but two (Char Badna near Barisál and Char Chandrail in Patuakhali subdivision) within the subdivision of Dakhin Shahbázpur and consist of lands which have accreted to the main land or formed as new island since the time of the permanent settlement, and came into the possession of Government either as estates resumed under Regulation II of 1819, as island chars taken possession of on behalf of Government under Regulation XI of 1825, or as surplus accretions to permanently-settled estates brought under assessment by the dearah authorities.

31. *Survey operations.*—The whole work done from the commencement of survey operations down to 30th September 1890 is shown below as accurately as I am able to give it. Out of the 27 estates, the survey had been made and records prepared of six estates—Joynagar, Lamchipata, Shambupura, Golakpura, Char Padma, Char Badna, covering an area of 25·72 square miles by local agency under the supervision of Babu Giris Chandra Dutt, Deputy Collector of the regular establishment, and of three estates—Chars Jangla, Kalachand and Sitaram—the survey had been made under the supervision of the Subdivisional Officer of Bhola, and of one estate—Char Chandrail—under the Subdivisional Officer of Patuakhali. In the case of Char Jangla the survey was made for a settlement under the Regulation, but after it was completed it was found advisable to have settlement made under the Tenancy Act, and notification was published accordingly. The cost incurred by these officers as pay of amíns for survey and preparation of records is Rs. 4,213-4-9 and the total area surveyed 28·98 square miles.

32. For the survey and khanapuri of the remaining 17 estates a professional party under the orders of Colonel Steel arrived on the island in December 1889, and remained there up to the following June. In that time the party made—

(A) A traverse survey extending over 157·46 square miles, but in this area is included 92·3 square miles, the area of chars Bhuta Jahajmara and part of char Annanda Prosad, &c., which are not at present under settlement, but which it was advisable either for convenience of the survey or for the prevention of further disputes as to their position to include within the area of traverse survey. Of the estates actually under settlement the traverse survey only covered 65·1 square miles, *i.e.*, the area of the 16 estates:—(1) Lamchi Koralmara, (2) Kristo Prosad No. 5257, (3) Bhusan Lapta Madanpura, (4) Char Umed, (5) Char Bhairab, (6) Char Price, (7) Char Lakhi, (8) Char Koralmara, (9) Madhupura, (10) Ganeshpura, (11) Lalmohan, (12) Bairagya, (13) Char Lord Hardinge, (14) Char Kali, (15) Char Fasson, (16) Char Udaykali, the party being unable to make traverse survey of one estate—Char Drummond No. 5305—as it was found to be entirely under water at high tide.

(B) Cadastral survey of the 12 estates:—(1) Lamchi Koralmara, (2) Kristo Prosad, (3) Bhusan Lapta Madanpura, (4) Char Umed, (5) Char Bhairab, (6) Char Price, (7) Char Lakhi, (8) Char Koralmara, (9) Madhupura, (10) Goneshpura, (11) Lalmohan, (12) Bairagya. The area of these villages by the cadastral survey is 46·79 squre miles, but the Settlement Officer informs me the area by traverse survey is 57·2 square miles. The party has given no explanation of this wide difference, nor is the Settlement Officer quite certain as yet as to the reason for the discrepancy, but the difference is probably due to omission of the area of jungle land. The Settlement Officer will, however, make a strict enquiry on this point.

(C) Khanapuri of 11 of the above-named 12 villages, the exception being Char Lakhi, comprising an area of 3·75 square miles. The area which the party gives as the area over which khanapuri and record writing was completed is 41·42. This 41·42+3·75, the area of Char Lakhi, comes to 45·17 square miles, which is less by 1·62 square miles than the area by cadastral survey. The Settlement Officer has yet to find out wherein the difference lies.

In June 1890 the party went into recess at Barrackpore, and I am unable to state what work was done by its members from that month up to the end of September 1890. I presume they were engaged in calculating areas, filling up the remaining columns of the khasra, preparing khatian and terij with respect to villages of which the khanapuri had been done on the field, inking up the maps and preparing tracings of the maps for the Settlement Officer.

33. In November 1890 the party forwarded to the Settlement Officer khasra, khatian terij, milan khasra, area and crop statement, and tracings of maps of six estates—Lamchi Koralmara Kristo Prosad, Bhusan Lapta Madanpura, Koralmara, Bhairab, and Price—outline maps of four estates named on the margin, of which traverse survey only was made, and field map of the estate Char Lakhi, of which the party had not done the khanapuri, khasra, &c., for Char Umed No. 5256 were forwarded in January 1891, of Madhupura and Lalmohan in April, and of Goneshpura and Bairagya in May 1891. The records of the last named four estates were forwarded in a very incomplete state, the terij and khatians being left half done and full of discrepancies; the writing, too, was in great part illegible. The seven villages, namely, (1) Lamchi Koralmara, (2) Kristo Prosad, (3) Bhasan Lapta Madanpura, (4) Chur Bhairab, (5) Char Price, (6) Char Koralmara, and (7) Char Umed, of which the papers have been received in a complete form from the professional party, cover an area of 21·21 square miles. No information has been supplied as to what the party did in each month of the period from June 1890 to May 1891.

Char Lord Hardinge. | Char Udai Kali.
,, Kali. | ,, Fasson.

34. The total cost of the work done in these estates by the survey party, as reported by Colonel Strahan in his letter referred to in paragraph 9, is Rs. 13,841. No particulars whatever have been supplied to show how this sum is arrived at, or how much should be regarded as cost of traverse survey, cadastral survey, or khanapuri and record-writing, and if, as I believe, the distribution of the total cost between the wards' and Government estates is inequitable, the charge against the Government estates must be increased.

35. *Settlement work.*—As regards settlement work up to the 30th September 1890, little need be said. Babu Pyari Mohun Bose was appointed Settlement Officer for both wards'

and Government estates in the island of Dakhin Shabázpur in December 1889. The Government estates noted on the margin were made over to him on different dates, and two of these, however, viz., Joynagar and Lamchipata, were transferred from his file to that of Mr. Dutt on 14th July 1890. The settlement work which Babu Pyari Mohun Bose actually carried out by the end of September 1890 is shown below :—

1. Joyanagar, (2) Lamchipata, (3) Lamchi Koralmara, (4) Kristoprosad, (5) Char Koralmara, (6) Char Umed, (7) Char Bhairab, (8) Char Price, (9) Char Lakhi, (10) Lalmohan, (11) Char Lord Hardinge, (12) Char Kali, (13) Char Fasson, (14) Char Drummond, (15) Char Uday Kali, (16) Char Padma, (17) Shambupura, (18) Golakpura.

Attestation and record of rights and existing rents.—Attestation and record of rights and of existing rents of Char Joynagar and Lamchipata, which were made over to Mr. Dutt in July 1890. He (Babu P. M. Bose) also completed the settlement work of Char Badna, but the settlement was not actually sanctioned within the year under report. The greater part of the remainder of his time was usefully spent in assisting the survey party during their operations in this district (*vide* paragraph 14), and he was also employed in other work in connection with estates of which settlement was completed before 30th September 1890, and of which no notice is called for in this report.

36. The Subdivisional Officer of Bhola had been appointed Settlement Officer for the Government estates noted on the margin, but he did not have any regular settlement work actually carried out by the end of September 1890, except that he recorded the existing rights in Chars Kalachand and Sitaram and recorded fair rents in the latter estate and made first publication of draft records with respect thereto. The Subdivisional Officer of Patuakhali had on his file the case of Ohar Chandrail, and completed the settlement proceedings towards the close of the year, final report being submitted within the year under report.

1. Char Jangla.
2. Char Kalachand.
3. Bhusan Lapta Madanpura.
4. Madhupura.
5. Bairagya.
6. Goneshpura.
7. Char Sitaram.

37. Mr. Dutt joined his appointment as Assistant Settlement Officer for the Government estates on the 12th July 1890. Government estates noted on the margin were made over to him from the file of Babu Pyari Mohun Bose on the 14th July 1890. The settlement work which he carried out from the 14th July 1890 to 30th September is shown below :—

Jaynagar and Lamchipata.

(*a*) Supervision of the correction and copying of the records of Joynager and Lamchipata in the revised forms introduced.

(*b*) Settlement of disputes in these two estates.

(*c*) Making local enquiries regarding rent rates in and around these two estates.

38. *Total cost of survey and settlement.*—Assuming that the survey party completed their work within 30th September 1890, and that the figures as to cost given by Colonel Strahan are correct, the total cost of the operations on the 24 Government estates up to 30th September 1890 is shown below :—

Survey—

	Rs.	A.	P.
Cost incurred for survey by local agency ...	4,213	4	9
Ditto by survey party	13,841	0	0
Total ...	18,054	4	9

Settlement—

Cost incurred by Babu Pyari Mohun Bose (being one-third of total cost of his pay, allowance, and establishment—*vide* paragraph 19) as well as price of stones embedded by the professional party on the traverse lines of Government estates	1,986	14	7
Cost incurred by Mr. Dutt, his pay and establishment	1,236	13	1
Total ...	17,064	11	8

39. At the commencement of the year under report the work which remained to be done is shown below :—

Survey—

(*a*) Khanapuri and record writing of Char Lakhi No. 5243, covering an area of 3·75 square miles and revision of measurement papers and preparation of records of Char Jangla (area ·65 square miles).

(*b*) Completing the draft records of the four estates Lalmohan, Madhupura, Bairagya, and Goneshpur, of which the draft records were forwarded by the survey party in an incomplete state.

Settlement—

1. Lamchi Koralmara.	10. Goneshpura.
2. Kristo Prosad.	11. Bairagya.
3. Bhusan Lapta Madanpura.	12. Lalmohan.
4. Char Umed.	13. Char Lord Hardinge.
5. Char Bhairab.	14. Char Kali.
6. Char Price.	15. Char Fasson.
7. Char Lakhi.	16. Char Drummond.
8. Char Koralmara.	17. Char Udai Kali.
9. Char Madhupura.	18. Char Jangla.

(*a*) The entire settlement work of the estates noted on the margin.

(*b*) The settlement of disputes and fixation of fair rents for Joynagar, Lamchipata, Chur Padma, Shambhupura, Golakpura.

(*c*) Publication of the final records of the above-named five estates.

(*d*) Completion of settlement of Chars Kalachand and Sitaram.

(*e*) Submission of final report of Char Sitaram and sanction to settlement of Char Badna to be obtained. (NOTE.—Settlements are shown as pending in our register till formal sanction is recorded by the Collector, Commissioner, or Board, as the case may be.)

(*f*) Preparation of copies for tenants of all the estates under settlement.

40. *Work actually done during the year under report.*—Within the year the following estates were made over to Mr. Dutt from the file of Babu Pyari Mohun Bose:—Lamchi Koralmara, (2) Kristo Prosad, (3) Char Koralmara, (4) Char Umed, (5) Char Bairab, (6) Char Price, (7) Char Lakhi, (8) Char Lalmohan, (9) Lord Hardinge, (10) Char Kali, (11) Char Fasson, (12) Char Drummond 5305, (3) Char Udai Kali, and the following from the Subdivisional Officer of Bhola:—(1) Bhusan Lapta Madunpura, (2) Madhupura, (3) Goneshpura (4) Bairagya. These with Joynagar Lamchipata, which he had at the beginning of the year, make a total of 19 estates on file within the year.

The work done by him is shown below:—

Survey—

(*a*) Khanapuri and record writing of Char Lakhi completed comprising an area of 3·75 square miles.

(*b*) Completion of the record writing of the four estates Lalmohan, Madhupura, Bairagya, and Goneshpura, of which the draft records were forwarded by the survey party in an incomplete state, comprising an area of 32·2 square miles.

Settlement—

(*a*) Attestation, including record of rents and rights and fixation of fair rents completed in the four villages noted on the margin, comprising an area of 32·2 square miles.

1. Lalmohan.	3. Goneshpura.
2. Madhupura.	4. Bairagya.

(*b*) Publication of draft records after attestation, record of rents and rights and fixation of fair rents made with respect to ten villages named on the margin, comprising an area of 40·1 square miles.

1. Joynagar.	6. Char Bhairab.
2. Lamchipata.	7. Char Price.
3. Lamchi Koralmara.	8. Char Umed.
4. Kristo Prosad.	9. Char Lakhi.
5. Bhusan Lapta Madanpura.	10. Char Koralmara.

(*c*) Raiyats settled on patit land in Char Kristo Prasad, Lord Hardinge, Char Kali, comprising an area of 6 17 square miles. (This, which is a work very profitable to Government, is not a work which ordinarily comes within the province of a Settlement Officer. Mr. Dutt deserves much praise for his success in inducing settlers to take up these lands, which hitherto have been left in a state of jungle.)

(*d*) Final publication of record of rights made in the case of Lord Hardinge and Char Kali. The number of tenants whose rents and rights have been recorded, and for whom fair rents have been fixed by Mr. Dutt during the year under report, is 7,684; besides these, fair rents only were fixed by him for 4,866 tenants whose rents and rights were recorded by Babu Pyari Mohun Bose in the previous year. The number of suits disposed of by Mr. Dutt is 972—148 civil and 824 miscellaneous.

41. *Work done by Babu Pyari Mohun Bose—*

(*a*) The settlement of fair rents for 1,385 tenants of Chars Padma, Shambupura, and Golakpura.

(*b*) Publication of the final records of these three estates and submission of final reports.

(*c*) Preparation and distribution of copies to the tenants of these three estates.

(*d*) Disposal of objections and disputes as far as these three estates are concerned.

(*e*) Settlement of Char Padma sanctioned.

42. *Work done by the Subdivisional Officer of Bhola—*

Char Sitaram.—Settlement report submitted and sanctioned, rights of 38 tenants being recorded and rents settled.

Char Kalachand.—Fair rents settled.

Char Jangla.—Draft records prepared.

Work done by the Subdivisional Officer of Patuakhali—

Char Chandrail.—Final report submitted and settlement sanctioned.

43. The cost of operations during the year from 1st October 1890 to 30th September 1891—

Survey—Departmental—Rs. 381-4.* The survey work done under Mr. Dutt was done by his settlement establishment and is charged to settlement.

* This is amount paid in the year for work done departmentally in the preceding year.

Settlement—

	Rs.	A.	P.
Cost of settlement for the estates in Mr. Dutt's file ...	7,249	7	7
Cost of settlement for the estates in the file of Babu Pyari Mohun Bose	1,107	2	5
Cost of settlement for the estates in the file of the Sub-divisional Officer of Bhola	.....		
Total ...	8,356	10	0

44. *Work remaining to be done at the close of the year.*—With regard to Government estates under settlement, the work of survey and settlement which remained to be done at the close of the year under review was—

Survey ... ... *Nil.*

Settlement—

Babu P. M. Bose. (*a*) Obtaining sanction of Shambupura, Golakpura, and Char Padma.

Mr. Dutt. (*b*) Final report to be submitted of Chars Hardinge and Kali.

Mr. Dutt. (*c*) Final publication after settlement of disputes to be made in ten villages named on the margin.*

Mr. Dutt.
*1. Joynagar.
2. Lamchipata.
3. Kristo Prosad.
4. Lamchi Koralmara.
5. Bhusan Lapta Madanpura.
6. Char Bhairav.
7. Char Price.
8. Char Lakhi.
9. Char Koralmara.
10. Char Umed.

(*d*) Settlement of disputes and publication of draft records to be made in six villages named on the margin.†

(*e*) Preparation of copies for tenants for the villages named in *a*, *c*, *d*.

Mr. Dutt.
†1. Lalmohan.
2. Madanpura.
3. Bairagya.
4. Goneshpura.

Subdivisional Officer, Bhola.
5 Jangla.
6 Char Kalachand.

(*f*) Settling raiyats on patit land, part of Chars Umed, Bhairab, Price, and all of Char Fasson, with cadastral survey of the area settled and preparation of record of rights in respect thereof.

(*g*) *Chars Udai Kali and Drummond.*

45. It may here be noted that of the 24 estates shown as pending settlement at the commencement of the year under review, there is no settlement work to be done in Char Udai Kali, in which there are no tenants, and in respect to which the previous settlement, a farming settlement, will continue in force till 1302, after which raiyats may be induced to take up the land; and in Char Drummond, in which also there are no tenants and which is still under water at high tide. The names of these two estates will be removed from the list of pending cases.

Cases pending *at close of year*—	
Under *a* ...	3
„ *b* ...	2
„ *c* ...	10
„ *d* ...	6
„ *f* ...	1
„ *g* ...	2
	24
Finally disposed of during year	3
	27
Instituted during year	*Nil*
Pending at commencement of year	27

46. *Total cost of survey and settlement from the commencement to the year under report.*—The total cost from the commencement of operations to the close of the year is on the figures as adopted in the report—

	Rs.	A.	P.
Survey	18,435	8	9
Settlement	11,580	5	8
Total ...	30,015	14	5

47. *Estates under settlement under the Regulation.*—Of these estates I submit two lists, A and B, showing in A estates of which settlement has been completed and sanctioned during the year, and in B the estates of which settlement work was either not completed or, if completed, not sanctioned within the year under report.

48. Most of these estates are surplus alluvial accretions in the large rivers in the east and south of the district to permanently-settled estates, and were brought under assessment by the Diára Superintendent. Of these, some have come now under settlement as the term of first settlement has expired, and others have been under settlement since the close of the dearah operations, the settlement being delayed by various disputes. The balance of the estates other than these diára estates have come under settlement in consequence of purchase by Government at revenue sales, the estates being sold because they have suffered more or less from diluvion or are ferries or fishery which are treated as estates.

49. From the list A it will be seen that the settlement of 18 of these estates was completed and sanctioned during the year, and that the net annual gain to Government from the settlements is Rs. 2,433-6.

50. List B of estates still pending settlement shows 40 estates. Of these, 21 were brought under settlement towards the close of the year, and the others remained under settlement for the most part because of disputes as to whether they are or are not re-formations *in situ* of settled estates, and are pending orders of the Commissioner or the Board.

A	...	18
B	...	40
Diluviated	...	1
		59

As shewn at foot of list A, one estate was found to be diluviated, and the revenue thereof was remitted.

51. The cost* shewn in the lists A and B as expended over the survey of the above estates represents the money paid to amins engaged for the survey work. The estates against which no expenditure is shown were surveyed by kánungoes of the regular establishment. For settlement of the estates under the Regulation there is no settlement charge, as the work has been done by Deputy and Sub-Deputy Collectors of the regular establishment.

		Rs.	A.	P.
*A	...	733	12	0
B	...	1,938	5	3
Total	...	2,672	1	3

APPENDIX.—Returns A and B for Ward's estate No. 1763, and note thereto.

" Ditto for Government estates under Tenancy Act, and note thereto.

" Lists A and B for Government estates under Regulation.

Notes explaining discrepancies pointed out by His Honor the Lieutenant-Governor in the Resolution on report for 1890-91 (financial year).

Form A.

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed.			Number of villages of which the records have been handed over by Survey Department to the Settlement Officer—		Number of villages of which khanapuri and preparation of records have been completed under direct supervision of the Settlement Officer—		Total cost—						Rate per acre.		Increase of revenue—		Remarks.
													Up to 30th September 1890.		During the year under report.		Total.						
						Up to 30th September 1890.	During the year under report.	Total area surveyed.	Up to 30th September 1890.	During the year under report.	Up to 30th September 1890.	During the year under report.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Actually obtained.	Expected.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Dacca	Backergunge.	Dakhin Shaházpur estate, No. 1763.	(a) 37	(b) 86,272	Partly by professional and partly by non-professional agency.	Acres. 79,718·05	Acres. 153·95	(b) Acres. 79,872	...	14	...	13	Rs. A. P. 36,045 7 0	Rs. A. P. 3,227 10 0	Rs. A. P. 8,141 5 6	Rs. A. P. 6,410 9 9	(c) Rs. A. P. 44,186 12 6	Rs. A. P. 9,638 3 9	A. P. 8 2 *viz.*, 6 *a.* 8 *p.* by Survey Party and 1 *a.* 6 *p.* by Settlement Officer.	A. P. 1 9	...	(d)	

(a) When the survey began the number of villages was 38, but of these one was completely washed away by the river before the beginning of the year under review.
(b) The area in column 5 represents area surveyed by traverse only, and the area in column 9 represents what was surveyed cadastrally.
(c) Of the sum of Rs. 44,186-12-6 shown as total expenditure in survey, Rs. 36,045-7 were, as reported by Colonel Strahan in his No. $\frac{738}{50-75}$ of 6th November 1891, to your address, expended by the Survey Party, and the remaini Rs. 8,141-5-6 by Settlement Officer.
(d) As the estates are permanently-settled estates, there can be no increase of revenue.

H. SAVAGE,
Offg. Collector.

Note to return B, Ward's Estate 1763.

This return is prepared by Babu Pyari Mohan Bose. He accepts my view as to meaning of column 5 and 6, and has entered therein only villages with regard to which final publication has been made; bu in columns 9 and 10 he shows not merely the tenants in the villages given in column 3, but all tenants o those and other villages of which the rights and existing rents have been recorded. In columns 11 and 12 he shows the former rent and the rent under the present settlement of those tenants (included in the number in column 10) for whom fair rents have actually been settled or whose existing rent is accepted as the fair rent, there being no contest raised concerning it within the time allowed by the law. This i a confused way of filling up returns, but the words of the headings seem to justify the view taken by Babu Pyari Mohan Bose.

FORM B.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which record of rights have been completed—		Total number of tenants in the villages in column 4.	Number of tenants whose rents had been recorded and status determined.			Total rental of the tenants whose rents have been settled.				Remarks.
				Up to 30th September 1880.	During the year under report.		Up to 30th September 1880.	During the year under report.	Total of columns 8 and 9.	According to new settlement.	According to previous jamabandi.	Increase.	Decrease.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Dacca	Backergunge	Dakhin Shabázpur estate, No. 1763.	37	...	3*	85,000†	...	Rs. 8,067	Rs. 8,067	Rs. A. P. 6,747 8 9	Rs. A. P. 6,967 15 4	....	Rs. A. P. 220 6 7	

* *i.e.*, villages in which final publication has been made.
† Estimated. This figure represents the total number of khatians required.

Note to explain differences between figures submitted to His Honor the Lieutenant-Governor during his visit to Barisál in August 1891 *with those shewn in the Director of Land Records' report and those in the report now submitted under Tenancy Act.*

Director's Annual Report for the year from 1st April 1890 to 31st March 1891.		Figures supplied to His Honor.	Figures in present report and names of cases pending on 1st October 1890.	Cases pending on 30th September 1891.
Appendix A.	Report, paragraphs 26 to 33.			
1	2	3	4	5
Madhupura ...	Named four, viz.—		Madhupura ...	Joynagar.
Koralmara ...	1. Char Padma ...		Koralmara ...	Lamchipata.
Bhasan Lapta Madanpura.	2. Taluk Bisva Nath Thakurta.		Bhusan Lapta Madunpura.	Lamchi Koralmara.
Lamchipata ...	3. Char Shambupura.		Lamchipata ...	Kristo Prasad.
Char Joynagar ...	4. Golukpura ...		Char Joynager ...	Bhusan Lapta Madanpura.
„ Umed ...	Not named 17 (under survey party). These 17 are—		„ Umed ...	Cahr Koralmara.
„ Bhairav ...	1. Madhupura ...		„ Bhairav ...	„ Umed.
„ Price ...	2. Koralmara ...		„ Price ...	„ Bhairav.
„ Lalmohan ...	3. Bhusan Lapta Madanpura.		„ Lalmohan ...	„ Price.
„ Lamchi Koralmara.	4. Char Umed ...		„ Lamchi Koralmara.	„ Lakhi.
„ Bairagya ...	5. „ Bhairav ...	25	„ Bairagya ...	„ Lalmohan.
„ Hardinge ...	6. „ Price ...		„ Hardinge ...	„ Lord Hardinge.
„ Kristo Prosad...	7. „ Lalmohan ...		„ Kristo Prosad	„ Kali.
„ Kali ...	8. „ Lamchi Koralmara.		„ Kali ...	„ Fasson.
„ Gonespurah ...	9. „ Boyragia ...		„ Goneshpura ...	„ Drummond.
„ Fasson ...	10. „ Hardinge ...		„ Fasson ...	„ Udai Kali.
„ Drummond ...	11. „ Krisnaprosad		„ Drummond ...	„ Padma.
„ Uday Kali ...	12. „ Kali ...		„ Uday Kali ...	„ Shambupura.
„ Lakhi ...	13. „ Goneshpura		„ Sitaram ...	„ Golakpura.
„ Sitaram ...	14. „ Fasson ...		„ Lakhi ...	„ Madhupura.
„ Kalachand ...	15. „ Drummond		„ Kalachand ...	„ Bairagya.
„ Golokepura ...	16. „ Uday Kali...		„ Golakpura ...	„ Goneshpurah.
„ Shambupura ...	17. „ Lukhi ...		„ Shambupura ...	„ Jungla.
„ Badna ...	Named below, viz., Joynager and Lamchipata.		„ Badna ...	„ Kalachand.
„ Padma ...			„ Padma ...	
Taluk Bisva Nath Thakurta.			Taluk Bishwanath Thakurta.	
Char Jangla ...			Char Jangla.	
„ Badura or Bhadai.				
„ Sachilapur Kristokali.				
„ Kopalbera ...				
„ Chandrail ...				
Total ... 31	23	25	27	24

Explanation.

Of the 31 estates shown in column, (1) the settlements of taluk Bisva Nath (1) Thakurta, (2) Badura, (3) Sachilapur Krisnakali, and (4) Kapalberia=four only, were sanctioned before 1st October 1890, leaving 27 out of the 31 cases pending as shewn in column 4.

In *column* 2 appear accounts of only 23 cases. No special mention was made of the remaining 8 cases out of the 31 in column 1 (viz., of (1) Char Jangla, (2) Char Badura, (3) Sachilapur Kristakali, (4) Kapalberia, (5) Chandrail, (6) Sitaram, (7) Badna, (8) Kalachand) I presume because they were of no particular importance and were not on the file of special Settlement Officers.

The difference between columns 4 and 5 is due to the sanction of settlement of the three estates Sitaram, Badna, and Chandrail being given during the year, thus leaving 24 cases pending.

The difference between columns 3 and 5 is due to the inclusion by mistake in the list given to His Honor of Padma Manasha. Settlement of this estate had been begun under the Regulation, but it was found that it was advisable to bring it under the Tenancy Act, and application to that effect was made. Sanction, however, was not received till after 30th September 1891, and therefore the estate up to that date should properly be shewn as under the Regulation.

A.

Statement showing the Government estates under survey and settlement of revenue during the year from 1*st October* 1890 *to* 30*th September* 1891.

Division.	District.	Number of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed.			Number of villages of which the records have been handed over by the Survey to the Settlement Officer—				Total cost.								Rate per acre.		Increase of Revenue—	
						Up to 30th September 1890.	During the year under report.	Total area surveyed.	Up to 30th September 1890.		During the year under report.		Up to 30th September 1890.			During the year under report.			Total.					
									From the Survey Party.	Made by local agency.	From the Survey Party.	Made by local agency.	Survey.		Settlement.	Survey.		Settlement.	Survey.	Settlement.	Survey.	Settlement.	Actually obtained.	Expected.
													By the professional Party.	Departmentally.		By the professional Party.	Departmentally.							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
						Acres.		Acres.					Rs.	Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	As. P.	As. P.	Rs. A. P.	Rs.
Dacca.	Backergunge.	27	27	64,060·16	Sixteen by professional, and 10 by non-professional agency (one not surveyed).	60,889·26	...	60,889·26	...	10	16	...	13,841	4,213 4 9	3,223 11 8	...	381 4 0	8,356 10 0	18,435 8 9	11,580 5 8	4 0½	3 0½	5,639 4 4½*	19,475

* This from the villages Shambupura, Padma, Badna, Sitaram, Chandrait, Hardinge, and Kali, of which the records have been finally published.

NOTE TO STATEMENT B.

Tenancy Act Cases.

This statement has been drawn up by Mr. Dutt. He understands the heading of columns 5 and 6 to mean villages in which existing rents and rights have been recorded and fair rents fixed. I did not know whether his view is correct, so I let his figures stand, as they show fairly well the progress made in the work.

It seems to me, however, that the words of the heading really mean cases in which final publication has been made, and if my view be correct, column 5 should show entries only against villages Badna and Chandrail and column 6 should show entries only against churs Shambupura, Golakpura, Padma, Hardinge, and Kali, and if, as I presume, the following column should only be filled up against the estate against which there are entries in columns 5 and 6, the entries against estates other than those noted above should be struck out.

The headings are, however, far from clear, and it may be that, although I am right as regards the meaning of heading 5, that Mr. Dutt's view of the other headings is correct.

B.

Under Tenancy Act.

Statement showing progress made in Government Estates in record of rights and settlement of rents up to 30th September 1891.

Division.	District.	Names of Estates.	Total number of villages.	(a) Number of villages in which record of rights has been completed— Up to 30th September 1890.	(a) Number of villages in which record of rights has been completed— During the year under report.	Total number of tenants in the villages included in column 4.	Number of Tenants whose rent had been recorded and status determined. Up to 30th September 1890.	Number of Tenants whose rent had been recorded and status determined. During the year under report.	Number of Tenants whose rent had been recorded and status determined. Total of columns 8 and 9.	Total rental of tenants whose rents had been settled. According to new settlement.	Total rental of tenants whose rents had been settled. According to previous jamabandi.	Total rental of tenants whose rents had been settled. Increase.	Total rental of tenants whose rents had been settled. Decrease.	Total Revenue. According to present settlement.	Total Revenue. According to previous settlement.	Total Revenue. Increase.	Total Revenue. Decrease.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Dacca.	Backergunge.	Char Badna, No. 4657*	1	1	...	38	38	..	38	Rs. A. P. 2,887 7 0¼	Rs. A. P. 2,223 12 7¼	Rs. A. P. 658 10 5	...	Rs. A. P. 1,317 15 6	Rs. A. P. 972 2 10¾	Rs. A. P. 345 12 7¼	...	* These are the villages the records of which have been finally published (*vide* note to this return). The figures shown in columns 16 and 17 against the estates marked* are actual figures. Those against other estates represent the figures which will be actual figures if no change before final publication.
		Char Sitaram, ,, 5196*	1	1	...	38	38	...	38	768 4 3	393 0 0	375 4 3	...	768 4 3	393 0 0	375 4 3	...	
		Chandrail, ,, 6277*	1	1	...	96	96	...	96	2,083 15 0	1,846 6 0½	237 8 11½	...	2,083 15 0	1,846 6 0½	237 8 11½	...	
		Char Shambhupura,, , 5225* ...	1	1	...	505	505	..	505	12,164½ 2 3	9,166 2 2	2,998 0 1	...	4,920 1 5	3,452 4 1	1,467 13 4	...	
		Char Golekpura, ,, 5226*	1	1	...	346	346	..	346	11,883 14 3	9,506 13 2	2,377 1 1	...	4,140 3 3	3,024 8 0	1,115 11 3	...	
		Char Padma, ,, 5234*	1	1	...	534	534	...	534	11,574 14 2	8,507 5 9	3,067 8 5	...	3,894 15 3	2,571 0 0	1,323 15 3	...	
		Lord Hardinge, ,, 5245*	1	...	1	140	...	140	140	841 0 9	200 0 0	641 0 9	...	841 0 9	200 0 0	641 0 9	...	
		Char Kali, ,, 5262*	1	...	1	17	...	17	17	196 2 0	64 0 0	132 2 0	...	196 2 0	64 0 0	132 2 0	...	
																5,639 4 4½		
		Char Jaynagar, ,, 5285	1	1	...	4,254	4,254	Fair rents of these 2 villages fixed by Mr. Dutt in the year under report.	4,254	49,904 6 10½	43,982 6 8½	5,922 0 2	...	25,078 12 3	20,848 14 8	4,229 13 7	...	
		Lamchipata, ,, 5219	1	1	...	612	612		612	9,972 5 7	9,296 14 11	675 6 10	...	3,978 12 11	3,502 4 3	476 8 8	..	
		Lamchi Koralmara, ,, 6384	1	...	1	68	...	68	68	1,597 15 9	634 1 10	963 13 11	...	1,597 15 9	634 1 10	963 13 11	...	
		Kristo Prosad, ,, 5257	1	...	1	81	...	81	81	2,983 0 0	456 6 9	2,526 9 3	...	2,983 0 0	365 0 0	2,618 0 0	...	
		Bhasan Lapta Madanpura, No. 5292 ...	1	...	1	18	...	18	18	390 6 6	101 7 0	288 15 6	...	200 10 9	10 0 0	190 10 9	...	
		Char Umed, No. 5256	1	...	1	180	...	180	180									
		Char Bhoirab, No. 5281, including ...	1	...	1					5,157 0 0	930 7 0	4,226 9 0	...	5,157 0 0	440 0 0	4,717 0 0	...	
		Char Price, No. 5302	1	...	1	35	...	35	35									
		Char Lakmi, ,, 5243	1	...	1	139	...	139	139	2,706 9 9	1,212 15 0	1,493 10 9	...	1,738 9 6	982 10 3	755 15 3	...	
		Koralmara, ,, 5250	1	...	1	74	...	74	74	5,963 8 0	633 12 0	5,329 12 0	...	5,485 0 0	420 0 0	5,065 0 0	...	
		Madhupura, ,, 5215	1	...	1	1,468	...	1,468	1,468	...	...	...	...	...	...	...	...	
		Goneshpura, ,, 5221	1	...	1	1,266	..	1,266	1,266	...	...	...	...	...	...	...	...	
		Lalmohan, ,, 5245	1	...	1	1,045	...	1,045	1,045	...	...	...	...	...	...	...	...	
		Bairagya, ,, 5216	1	...	1	3,153	...	3,153	3,153	...	...	...	...	...	...	...	...	
		Char Fasson, ,, 6431	1	...	...	Nil	...	...	...	...	...	...	...	...	...	...	...	
		Char Drummond, ,, 5305	1	...	...	Nil	...	...	...	...	...	...	...	...	...	...	...	
		Char Uday Kali, ,, 5262	1	...	...	Nil	...	...	...	...	...	...	...	...	...	...	...	
		Char Jangla, ,, 4748	1	...	...	Not known yet.	...	...	..	...	...	...	...	...	...	...	...	
		Char Kalachand, ,, 5260	1	...	1	80	...	80	80	693 3 2	235 4 6	457 14 8	...	693 3 2	235 4 6	457 14 8	...	
		Total ...	27	8	15	14,187	6,423	7,764	14,187	1,21,768 3 5½	89,396 3 5½	32,372 0 0¾	...	65,075 9 9	39,961 8 6½	25,114 1 2¾	...	

(a) A doubt exists as to the meaning of this column. I think it means the record of rights apart from fixing of fair rents.

Note.—This and return A of Tenancy Act cases have been copied by Mr. Dutt's amla, who have done the copying in a slovenly manner. To save a day, however, I send them on in their present condition.

H. SAVAGE,
Offg. Collector.

STATEMENT A.—*Cases disposed of under old Regulations.*

Date of institution of case.	Name and number of estate.	Number of holdings in the estate.	Work done up to 30th September 1890.	Cost of survey incurred up to 30th September 1890.	Work done from 1st October 1890 to 30th September 1891.	Cost of survey incurred from 1st October to 30th September 1891.	Total cost of survey to 30th September 1891.	Area surveyed in bighas.	Revenue by previous settlement.	Revenue by present settlement.	Increase.	Decrease.
1	2	3	4	5	6	7	8	9	10	11	12	13
COLLECTOR.												
				Rs. A. P.		Rs. A. P.	Rs. A. P.	B. K. C.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
7th October 1890	Ferry in the Biskhali and Tulatali river, No. 6259.	...	.....	...	Settled by auction.	...	...	...	7 0 0	8 0 0	1 0 0	...
Ditto ...	Ferry in Srimantapur river, No. 6260.	...	.....	...	Ditto ...	...	...	...	25 0 0	115 0 0	90 0 0	...
Ditto ...	Ferry in river Koterhat, No. 6257.	...	.....	...	Ditto ...	...	...	...	382 0 0	390 0 0	8 0 0	...
17th January 1891.	Ghop Jalker in the river Ilsa, No. 4861.	...	.....	...	Ditto ...	...	...	...	1,000 0 0	645 0 0	...	355 0 0
DEPUTY COLLECTOR OF BHOLA.												
6th April 1887 ...	Surplus land of Kachia, No. 6409.	18	Measurement completed and tested. Appeals disposed of by Collector. Settlement report submitted but returned for correction.	...	Completed and sanctioned.	...	...	835 17 18	117 0 0	198 1 7½	81 1 7½	...
DEPUTY COLLECTOR OF PEROZEPORE.												
7th October 1890	Char Lakhakati, No. 4711.	18	.....	...	Completed and sanctioned.	...	...	27 14 8	27 4 0	28 10 11	1 6 11	...
BABU PYARI MOHUN BOSE, SUB-DEPUTY COLLECTOR.												
5th December 1887.	Char Nalgora, No. 5231.	112	Measurement completed.	81 5 9	Ditto ...	...	81 5 9	2,074 10 4	1,595 13 9	1,595 13 9	...	...
BABU AKHIL CHUNDER ROY, SUB-DEPUTY COLLECTOR.												
5th December 1887.	Baherchar Khudrakati, No. 4639.	118	Measurement made and tested, miscellaneous cases decided, and records corrected.	76 8 6	Ditto ...	...	76 8 6	2,119 18 4	2,087 0 0	2,348 11 9	261 11 9	...
20th November 1888.	Dearah char Ranga Bhanga, No. 6338.	4	Measurement made and tested, rates fixed, miscellaneous cases decided, and papers partly corrected according to decision.	...	Ditto ...	...	...	151 12 0	19 0 0	149 0 0	130 0 0	...
Ditto ...	Char Jainkati, No. 4775.	133	Settlement proceedings completed and submitted.	150 9 0	Sanctioned ...	...	150 9 0	1,917 15 12	2,622 00	2,811 0 0	189 0 0	...
18th December 1888.	Joar Chandergao, No. 3196.	73	Measurements made and tested.	...	Completed and sanctioned.	50 0 0	50 0 0	475 4 8	650 8 0	499 9 4½	...	150 14 7½ Owing to diluvion.
7th October 1890	New char opposite to Ram chur, No. 5001.	68	.....	...	Settlement completed and sanctioned.	85 4 0	85 4 0	1,065 12 8	340 0 0	828 11 0	488 11 0	...
Ditto ...	Surplus alluvial accretion to char Sarikal, 6th block, No. 6316.	23	.....	...	Ditto ...	40 0 0	40 0 0	805 7 4	128 0 0	124 0 0	...	4 0 0 Owing to diluvion.
Ditto ...	Surplus alluvial accretion to Alimabad, No. 6327.	32	.....	...	Ditto ...	87 4 8	87 4 8	1,091 1 0	251 0 0	376 0 0	125 0 0	...
25th March 1891	Char Bishkatali, No. 4754.	New char.	.....	...	Ditto ...	...	...	4,048 6 4	0 8 0	800 0 0	799 8 0	...

STATEMENT A.—*Cases disposed of under old Regulations*—concluded.

Date of institution of cases.	Name and number of estate.	Number of holdings in the estate.	Work done up to 30th September 1890.	Cost of survey incurred up to 30th September 1890.	Work done from 1st October 1890 to 30th September 1891.	Cost of survey incurred from 1st October to 30th September 1891.	Total cost of survey to 30th September 1891.	Area surveyed in bighas.	Revenue by previous settlement.	Revenue by present settlement.	* Increase.	Decrease.
1	2	3	4	5	6	7	8	9	10	11	12	13

BABOO KALI PROSAD CHATTRÁJEE, SUB-DEPUTY COLLECTOR.

				Rs. A. P.		Rs. A. P.	Rs. A. P.	B. K. C.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
th December 1887.	Ayerkandi, No. 6312.	61	Settlement proceedings completed.	25 8 9	Sanctioned ...	...	25 8 9	574 17 12	331 0 0	419 0 0	88 0 0	...
8th November 1888.	Taluq Ram Sanker Das, No. 1978.	35	Measurements completed in July 1890.	...	Settlement completed and sanctioned.	...	...	104 5 12	88 0 0	92 0 0	4 0 0	...
th October 1890	Surplus alluvial accretion to Maisagogra, No. 6411.	10	.....	...	Ditto ...	137 3 9	137 3 9	1,996 5 4	193 1 3	359 0 0	165 14 9	...
				331 0 0	.....	399 12 0	733 12 0	...	...	...	2,433 6 0*	*Gain to Government.
th September 1890.	Char Lakhi, No. 4648.	...	.....	...	On enquiry estate found to be diluviated and revenue was remitted.	...	...	...	...	...	...	...

* Gain.

H. SAVAGE,
Collector.

STATEMENT B.—*Of cases under old Regulations pending at end of year.*

Date of institution of case.	Name and number of estate.	Number of the holdings in the estate.	Work done up to 30th September 1890.	Cost of survey incurred up to 30th September 1890.	Work done from 1st October 1890 to 30th September 1891.	Cost of survey incurred from 1st October to 30th September 1891.	Total cost of survey to 30th September 1891.	REASONS WHY PENDING.
1	2	3	4	5	6	7	8	9
				COLLECTOR.				
				Rs. A. P.		Rs. A. P.	Rs. A. P.	
20th July 1888 ...	Taluq Tara Chand Roy, No. 468.	.....	.....	.....	.....	.....	...	The estate has been found to lie within the geographical limits of the district of Faridpur, and correspondence is going on about its transfer to that district.
14th August 1889 ...	Char Lakhi *alias* Padma Manasa, thak No. 1733.	.....	A portion of the estate measured.	293 10 0	A portion of the estate was formerly released by the Commissioner Report made for inclusion of that portion, and appeal made to Board which has been decided.	.....	293 10 0	
14th September 1891	Fishery in Jahapur river, No. 4689.	.....	.....	.....	Nil	.....	.....	To be settled by auction in March 1892.
Ditto ...	Fishery in river Kumarkhali, No. 6258.	.....	.....	.....	.....	.....	.....	Ditto.
				DEPUTY COLLECTOR OF PATUAKHALI.				
8th September 1890	Taluk Kali Nath Chatterji, No. 1515.	.....	.....	.....	Kánungo enquired into the objection of the Nawab about possession of a certain portion of this estate, settlement of the rest ordered, and kánungo directed to measure.	.....	.....	Portion in possession of Government is under settlement. Question of suing the Nawab or possession of the remainder under consideration.
7th October 1890 ...	Char Taterkati, No. 4810.	.....	.....	.....	Measurement commenced	.....	.....	Kánungo had no time to complete the measurement.
7th July 1891 ...	New char in the river Kajal, No. 6365.	.....	.....	.....	Nil	.....	.....	Measurement could not be commenced on account of the char being flooded.
7th September 1891	Surplus alluvial accretion to Char Gazi, No. 6401.	.....	.....	.....	Nil	.....	.....	Instituted at close of the year.
				MR. D. D. DUTT, ASSISTANT SETTLEMENT OFFICER OF GOVERNMENT ESTATES.				
25th November 1889	Surplus alluvial accretion to Gangapur Shakuchia, No. 6375.	.....	Survey completed in April 1890.	.....	Ijára settlement made by auction on 19th October 1890, which was disapproved and estate held under khas management.	.....	.....	Pending final decision as to form of settlement to be finally adopted.
Ditto ...	Char Barton, No. 6059	.....	Survey completed ...	.....	Farming settlement made by auction which was disapproved and the estate held under khas management.	.....	.....	Ditto.
				BABU AKHIL CHANDRA ROY, SUB-DEPUTY COLLECTOR.				
16th April 1887 ...	Surplus alluvial accretion to mouza Potka, No. 6436.	34	Pending reference to Commissioner for release of certain lands.	72 0 0	Nothing	.....	72 0 0	Pending order on reference to Commissioner.
19th April 1888 ...	New char in the Agunmukha river on the south of Potka.	1 Talukdar; no other tenant.	Measurement tested and some miscellaneous cases decided.	.....	Last appeal in a miscellaneous case decided on 9th September 1891. Transferred from Patuakhali on 10th September 1891 to file of Akhil Chandra Roy.	.....	.....	Appeal decided near close of year.
20th November 1888	Surplus land of Madhab Roy, village No. 6331.	69	Measurement made, settlement pending order of Commissioner on reference for release of certain land.	81 9 0	Nothing	.....	81 9 0	Pending order of Commissioner on reference made.
8th September 1890	Jhilbania, No. 5111 ...	37	Measurements made and completed, and some enquiries made under Subdivisional Officer of Patuakhali.	.....	Transferred from Patuakhali on 28th July 1891 to file of Babu Akhil Chandra Roy. Summary settlement for 1890-91 made, some miscellaneous cases decided, kabuliyats taken for regular settlement.	.....	.....	Pending disposal of miscellaneous cases.
27th September 1890	Shamasdi Baligaon, No. 4605.	155	.....	.....	Settlement proceedings submitted after deciding all miscellaneous cases on 28th September 1891. Pending reference to Commissioner.	120 9 6	120 9 6	Pending order on reference to Commissioner.

STATEMENT B—*Of cases under old Regulations pending at end of year.*

Date of institution of case.	Name and number of estate.	Number of the holdings in the estate.	work done up to 30th September 1890.	Cost of survey incurred up to 30th September 1890.	Work done from 1st October 1890 to 30th September 1891.	Cost of survey incurred from 1st October to 30th September 1891.	Total cost of survey to 30th September 1891.	REASONS WHY PENDING
1	2	3	4	5	6	7	8	9
BABU AKHIL CHANDRA ROY, SUB-DEPUTY COLLECTOR—*concluded.*								
7th October 1890 ...	New char in river Arialkhan, No. 6342.	34	.....	Rs. A. P.	Partly measured ...	Rs. A. P.	Rs. A. P.	Pending completion of measurement by the kánungo.
3rd June 1891 ...	Peerbux taluk, No. 2631.	.....	.....	.....	Received on the 4th June 1891. Maps compared. Estate found to be entirely washed away. Recommended for remission of revenue.	.....	.....	Pending order of Board for remission.
7th September 1891	Ram Mohon Sen, taluk No. 3775.	...	Nil ...	.....	Nil ...	.....	.....	Instituted towards close of the year.
11th September 1891	Surplus alluvial accretion to Hajipur, No. 6374.	...	Nil ...	.....	Nil ...	.....	.....	
Ditto ...	Surplus alluvial accretion to Shefali Shamaya, No. 6378.	...	Nil ...	.....	Nil ...	.....	.....	
Ditto ...	Surplus alluvial accretion to Krishnapura, No. 6415.	...	Nil ...	.....	Nil ...	.....	.....	
Ditto ...	Surplus alluvial accretion to Shakuchia, No. 6410.	...	Nil ...	.....	Nil ...	.....	.....	
Ditto ...	Char Kali Das, No. 5283	...	Nil ...	.....	Nil ...	.....	.....	
Ditto ...	Surplus alluvial accretion to Algadi, No. 6377.	...	Nil ...	.....	Nil ...	.....	.....	
Ditto ...	Baradalua, No. 6400 ...	...	Nil ...	.....	Nil ...	.....	.....	
Ditto ...	Char Pellew *alias* Bhadai, No. 6386.	...	Nil ...	.....	Nil ...	.....	.....	
BABU KALI PRASAD CHATTERJEE, SUB-DEPUTY COLLECTOR.								
8th September 1890	Char Garaya, No. 4901	6	.....	.....	Settlement work compared and report submitted to Collector.	.....	.....	Pending sanction.
29th September 1890	Nalchiti Darichur, No. 6281.	...	.....	.....	Canongoe for measurement. Measurement begun.	.....	.....	Pending completion of measurement by kánungo.
7th October 1890 ...	Char Ilsa Gogra, No. 4979.	4	.....	.....	Settlement work completed and final report submitted.	1,370 8 9	1,370 8 9	Pending sanction.
8th September 1890	Kumarkhali Hat, No. 1535.	...	.....	.....	On enquiry found to be diluviated. Included in return No. IX for remission of revenue.	.....	.....	Pending orders of Board for remission.
7th October 1890 ...	Taluk Shib Narain Sen, No. 2991.	1	.....	.....	Measurement completed ...	.....	.....	Pending test of measurements, &c.
7th September 1891	Taluk Maniram Sarma, No. 2860.	Not known.	.....	.....	Several thak maps and papers copied.	.....	.....	Instituted towards close of the year.
Ditto ...	Taluk Ramsaran Tahildar, No. 2967.	...	.....	.....	Ditto ...	.....	.....	
Ditto ...	Taluk Chandra Lakhi Narain Das, No. 2735.	...	.....	.....	Ditto ...	.....	.....	
Ditto ...	Surplus alluvial accretion to Deula, No. 6376.	6	.....	.....	Ditto ...	.....	.....	
Ditto ...	Taluk Shib Ch. Bose, No. 6203.	8	.....	.....	Ditto ...	.....	.....	
11th September 1891	Char Gopalpur, No. 4205.	Not known.	.....	.....	Ditto ...	.....	.....	
Ditto ...	Surplus alluvial accretion to Moisa, No. 6229.	51	.....	.....	Ditto ...	.....	.....	
Ditto ...	Surplus alluvial accretion to Hosnabad Kandarpapur, No. 6335.	1	.....	.....	Ditto ...	.....	.....	
Ditto ...	Surplus alluvial accretion to Medna, No. 6349.	...	.....	.....	Received on 15th September 1891. Kánungo reports that the estate has been washed off.	.....	.....	
				447 3 0		1,491 2 3	1,938 5 3	

CAMP DAULATKHAN,
The 31st December 1891.

H. SAVAGE,
Offg. Collector.

Appendix A.

Note explaining differences between figures shown in Director's report, those supplied to His Honor the Lieutenant-Governor on his visit, and the figures shown in this report regarding cases under the Regulations.

The 35 estates mentioned by the Director are figures for two years, as far as I can make out. They do not seem to have been supplied for any one year from our office.

The number 23 supplied to His Honor is less by one than the actual number pending at time of his visit. This one is the Char Padma Manasha entered by mistake as one of the estates under the Tenancy Act (*vide* explanatory note regarding those estates).

The number actually pending, according to the register when His Honor was here, was 24. After the visit five cases were completed and 21 new cases added, leaving at the close of the year 40 cases pending.

CAMP DAULATKHAN,
The 31st December 1891.

H. SAVAGE,
Offg. Collector.

APPENDIX L.

No. 53T., dated Camp Gulshakhali, the 24th January 1892.

From—H. SAVAGE, Esq., Collector of Backergunge,
To—The Director of Land Records and Agriculture, Bengal.

IN continuation of this office No. 2520L.R., of the 16th instant, I have the honour to state that the statements A and B submitted to you direct with the half-yearly reports of the Settlement Officers of the Government and the wards' estates (*vide* letters Nos. 123, dated 23rd October 1891, from Mr. Dutt, and 158, dated 23rd October 1891, from Babu Peari Mohan Bose) contained numerous inaccuracies which would be most expensive to correct by telegram. Revised statements A and B for the Government estates showing therein the figures of each Settlement Officer in the district separately are herewith sent to enable you to correct their individual statements.

2. You have not received the half-yearly figures of the Subdivisional Officer of Bhola, as he did not submit any half-yearly report, but I give his figures to enable you to use them if necessary.

3. As the statements A and B submitted with Peari Babu's No. 158, dated 23rd October 1891 of the wards' estates do not require much correction, I simply give below revised figures for certain columns instead of submitting fresh statements. The figures are given below:—

STATEMENT A.

The phrase "and 1,764" should be struck off from column 3.

For 38 in column 4,	please read 37.				
„ Rs. 1,780-8-8	in column	12,	please read	Rs.	37,825-15-8.
„ „ 5,961-14-11	ditto	13,	ditto	„	3,632.
„ „ 8,141-5-6	ditto	16,	ditto	„	44,186-12-6.
„ „ 7,308-4-10	ditto	17,	ditto	„	9,638-3-9.
„ As. 1-7	ditto	18,	ditto	As.	8-2.
„ „ 1-5	ditto	19,	ditto	„	1-9.

STATEMENT B.

For 38 in column 4, please read 37,
„ nil ditto, ditto 37,

and strike off the remarks.

4. The remarks on the annual returns apply to these returns also. I regret there has been a delay in submitting revised figures, as I thought you probably would not require revised figures for the half-yearly returns. This letter is delayed, as I am out on tour in the south of the district and a long way from the sadar.

A.

Revised statement showing the Government Estates under Survey and Settlement of Revenue under the Tenancy Act during the half-year ending 30th September 1891.

Division.	District.	Number of estates.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed: Up to 31st March 1891.	Area surveyed: During the half-year under report.	Area surveyed: Total area surveyed.	Number of villages of which the records have been handed over by the survey party to the Settlement Officer—: Up to 31st March 1891.	Number of villages of which the records have been handed over by the survey party to the Settlement Officer—: During the half-year under report.	Total cost— Up to 31st March 1891. Survey. By the survey party.	Total cost— Up to 31st March 1891. Survey. By local agency.	Total cost— Up to 31st March 1891. Settlement.	Total cost— During the half-year under report. Survey.	Total cost— During the half-year under report. Settlement.	Total cost— Total. Survey.	Total cost— Total. Settlement.	Rate per acre. Survey.	Rate per acre. Settlement.	Increase of revenue— Actually obtained.	Increase of revenue— Expected.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	12A	13	14	15	16	17	18	19	20	21	22
		In the file of Mr. D. Dutt.				Acres.		Acres.			Rs.	Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs.
Dacca.	Backergunge.	19	19	54,552·61	Sixteen by professional and seven by non-professional agency, and one (char Drummond) not surveyed.	51,382·52	...	51,382·52	14	4	13,841	2,426 0 0	4,606 4 1	...	3,880 0 7	16,267 0 0	8,486 4 8	0 5 0	0 2 7½	773 2 9	19,017	
		In the file of Babu P. M. Bose.																				
		3	3	6,518·59		6,518·59	...	6,518·59	3	...	...	1,691 14 6	3,094 1 0	...	...	1,691 14 6	3,094 1 0	0 4 0	0 7 6	3,907 7 10	...	
		In the file of S. D. O. of Bhola.																				
		2	2	1,482·43		1,482·43	...	1,482·43	2	...	...	317 1 6	Nil.	...	...	317 1 6	...	0 3 5	...	...	458	
		24	24	62,553·63		59,383·54	...	59,383·54	19	4	13,841	4,435 0 0	7,700 5 1	...	3,880 0 7	18,276 0 0	11,580 5 8	0 4 11	0 3 1	4,680 10 7	19,475	

Columns 3, 4 *and* 5.—Annual return shows 27 estates and area 64,060·16. The difference is caused by the omission of chars Badna, Chandrail and Sitaram from this return, as settlement of those chars (area 1,506·53) was completed between 1st October 1890 and 31st March 1891.

Column 16.—The total differs from that in the annual return on account of cost of survey in the above-named three chars. There was no settlement cost in these chars, as settlement work was done by the regular establishment.

Column 20.—Difference due to omission of increase gained from the above-named three estates (churs).

H. SAVAGE,
Collector.

Dated 24th January 1892.

B.

Revised statement showing progress made in Government Estates in record of rights and settlement of rents under the Tenancy Act up to 30th September 1891.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which record of rights have been completed— Up to 31st March 1891.	Number of villages in which record of rights have been completed— During the half-year under report.	Total number of tenants in the villages in column 4.	Number of raiyats whose rent had been recorded and status determined. Up to 31st March 1891.	Number of raiyats whose rent had been recorded and status determined. During the half-year under report.	Number of raiyats whose rent had been recorded and status determined. Total of columns 8 and 9.	Total rentals of tenants whose rents have been settled. According to new settlement.	Total rentals of tenants whose rents have been settled. According to previous jamabandi.	Total rentals of tenants whose rents have been settled. Increase.	Total rentals of tenants whose rents have been settled. Decrease.	Government revenue— According to present settlement.	Government revenue— According to previous settlement.	Government revenue— Increase.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
		In the file of Mr. D. Dutt.								Rs. A. P.	Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.	
Dacca.	Backergunge.	Joynagar, No. 5285	1	1	...	4,254	4,254	...	4,254	49,904 6 10½	43,982 6 8¾	5,922 0 2	...	25,078 12 3	20,848 14 8	4,229 13 7	Remarks on Annual Return apply to this also Difference of total between this and Annual Return is due to exclusion of chars Badna, Sitaram, and Chandrail, of which settlement was concluded before 31st March 1891.
		Lamchipata, No. 5219... ...	1	1	...	612	612	...	612	9,972 5 9	9,296 14 11	675 6 10	...	3,978 12 11	3,502 4 3	476 8 8	
		Lamchi Koralmara, No. 6384...	1	1	...	68	68	...	68	1,597 15 9	634 1 10	963 13 11	...	1,597 15 9	634 1 10	963 13 11	
		Kristo Prasad, No. 5257 ...	1	1	...	81	81	...	81	2,983 0 0	456 6 9	2,526 9 3	...	2,983 0 0	365 0 0	2,618 0 0	
		Bhasan Lapta Madanpura, No. 5292	1	1	...	18	18	...	18	390 6 6	101 7 0	288 15 6	...	200 10 9	10 0 0	190 10 9	
		Char Umed, No. 5256	1	1	...	180	180	...	180	5,157 0 0	930 7 0	4,226 9 0	...	5,157 0 0	440 0 0	4,717 0 0	
		Char Bhairab, No. 5281 including Char Price, No. 5302 ...	1 1	1 1	...	35	35	...	35								
		Char Laksmi, No. 5243 ...	1	1	...	139	139	...	139	2,706 9 9	1,212 15 0	1,493 10 9	...	1,738 9 6	982 10 3	755 15 3	
		Koralmara, No. 5250	1	1	...	74	74	...	74	5,963 8 0	633 12 0	5,329 12 0	...	5,485 0 0	420 0 0	5,065 0 0	
		Madhupura, No. 5215	1	...	1	1,468	...	1,468	1,468	...	...	...	...	...	...	...	
		Goneshpura, No. 5221 ...	1	...	1	1,266	...	1,266	1,266	...	...	...	...	...	...	...	
		Lalmohan, No. 5245	1	...	1	1,045	...	1,045	1,045	...	...	...	...	...	...	...	
		Bairazga, No. 5216	1	...	1	3,153	...	3,153	3,153	...	...	...	...	...	...	...	
		Lord Hardinge, No. 5249 ...	1	...	1	140	...	140	140	841 0 9	200 0 0	641 0 9	...	841 0 9	200 0 0	641 0 9	
		Char Kali, No. 5252	1	...	1	17	...	17	17	196 2 0	64 0 0	132 2 0	...	196 2 0	64 0 0	132 2 0	
		Char Fasson, No. 6431 ...	1		...	Nil.	...	...	...	...	...	...	...	...	...	...	
		Char Drummond, No. 5305 ...	1	...	...	Nil.	...	...	...	...	...	...	...	...	...	...	
		Char Uday Kali, No. 5262 ...	1	...	...	Nil.	...	...	...	...	...	...	...	...	...	...	
			19	10	6	12,550	5,461	7,089	12,550	79,712 7 4¾	59,512 7 2¾	22,200 0 2	...	47,256 15 11	27,466 15 0	19,790 0 11	
		In the file of Babu P. M. Bose.															
		Char Shambupura, No. 5225	1	1	...	505	505	...	505	12,164 2 3	9,166 2 2	2,998 0 1	...	4,920 1 5	3,452 4 1	1,467 13 4	
		Golakpura, No. 5226	1	1	...	346	346	...	346	11,883 14 3	9,506 13 2	2,377 1 1	...	4,140 3 3	3,024 8 0	1,115 11 3	
		Char Padma, No. 5234 ...	1	1	...	534	534	...	534	11,574 14 2	8,507 5 9	3,067 8 5	...	3,894 15 3	2,571 0 0	1,323 15 3	
			3	3	...	1,385	1,385	...	1,385	35,622 14 8	27,180 5 1	8,442 9 7	...	12,955 3 11	9,047 12 1	3,907 7 10	
		In the file of the S. D. O. of Bhola.															
		Char Jangla, No. 4748 ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Char Kala Chand, No. 5260 ...	1	...	1	80	...	80	80	693 3 2	235 4 6	457 14 8	...	693 3 2	235 4 6	457 14 8	
			2	...	1	80	...	80	80	693 3 2	235 4 6	457 14 8	...	693 3 2	235 4 6	457 14 8	
			24	13	7	14,015	6,846	7,169	14,015	1,16,028 9 2¾	84,928 6 9¾	31,100 8 5	...	60,905 7 0	36,749 15 7	24,155 7 5	

Dated 24th January 1892.

H. SAVAGE,
Collector.

APPENDIX M.

No. 329, dated Suri, the 14th October 1891.

From—Babu Sukumar Haldar, Settlement Officer, Burdwan Raj Khas Mehals,
To—The Director of the Department of Land Records and Agriculture, Bengal.

Under orders received from the Government of Bengal, and also from the Board of Revenue, I have the honour to submit the following report of the settlements in my charge, showing the results of the half-year ending the 30th September last.

2. The mehals of the Burdwan Raj in this district, for which a survey and settlement have been ordered, are five in number :—

Tauzi No. 128—Gobrah.
" " 129—Maliha.
" " 188—Hukumapur.
" " 449—Panchberria.
" " 449—Chandnihat, Prochanderpur.

3. The survey and settlement of the first two have been abandoned at the request of the Manager, as the Raj holds only an undivided fractional share therein, and as the other co-sharers have not joined in the application for survey and settlement.

I.—Hukumapur.

4. The state of the work at the end of the last official year was thus described in my annual report for that year :—

"Para. 6. All applications for settling fair rents having been disposed of, and all disputes of the nature mentioned in section 106 of the Bengal Tenancy Act having been decided, all that remains to be done is to finally frame the records in accordance with the result of these applications and disputes, and cause them to be published under section 105 (2). The records, of 11 villages have already been published; those of 5 are entirely, and of 17 are partly ready for publication."

5. The work here described as outstanding was finished on the 30th June 1891, on which day the records of the last of the 88 villages were finally published under section 105(2), Bengal Tenancy Act.

6. In addition to this, all the khatians have been fair-copied. During your inspection you recommended the condemnation of the originals owing to their blotched and dirty appearance. Three copies had thus to be made—one for the collectorate, the second for the landlord, and the third for the tenants. Forty-five of the orignal khatians, however, were considered by me to be good enough for the collectorate record-room; of these, I have caused only two sets of copies to be prepared. Some difficulty was experienced in obtaining the services of intelligent copyists at the contract rates sanctioned under the Board's rules. Before the copyists got accustomed to the work, little progress was made, as much of the work done by them had to be condemned. Besides a thorough comparison of all fair copies with the originals by mohurirs employed for the purpose at the contract rates, I have, to insure accuracy, caused a careful recomparison of over 25 per cent. of the khatians to be made by mohurirs of the regular establishment. As far as I am able to judge, the fair copies prepared are correct.

7. The records of 87 villages were made over to the collectorate on and within 5th September. The Raj estate got copies of the records of these 87 villages by the 11th September; 2,554 tenants received their khatian slips up to the 30th September. That the rest (about 745 in number) are yet unprovided for is owing to their own indifference in the matter, for the khatian copies of their holdings are long ready in office, and notices of distribution have been issued village by village.

8. I have not yet accounted for one village, the circumstances regarding which are somewhat peculiar and require separate treatment. The records of this village were completed, and the 30th June was, by notice, fixed for their final publication. The records were published as notified; but such publication became irregular simply by the filing of a dispute case under section 106 of the Bengal Tenancy Act by the Raj, who claimed a large tract of unsurveyed land as forming part of the village. These lands were then surveyed, and the case, after being severely contested by the neighbouring zemindar, was decided as a civil suit, and the records of the village republished under section 105 (2) on the 6th October 1891. All this illustrates the practical difficulty of working section 106. The words "at any time before final publication" are much too vague. It would be desirable to substitute for them something to the following effect:—"At any time before the issue of a notice under section 105(2) for the final publication of the records." The records of the village concerned will be disposed of as soon as the offices reopen after the vacation.

9. In my report for the year ending the 31st March last, I spoke of having disposed of all disputes of the nature mentioned in section 106. The last application made by the Raj estate under section 106 during 1890-91 was received on the 16th September 1890. But, besides the case referred to in the preceding paragraph, the Raj has put in two other applications within the half-year under report, claiming similar relief under section 106. The disposal

of these two cases, in connection wherewith about 40 bighas have been and 600 more will have to be surveyed, and the distribution of the few khatians that remain forms my only work in connection with Hukumapur.

10. Fair-copying of khatians has been the principal work done during the half-year. But much was done besides. No less than 1,545 khatians were recorrected in consequence of *solehnamahs* or agreements filed in appeal. This necessitated the recorrection of the connected papers, khasras, terij, &c. Considerable time was taken up in preparing the statistical statements (Forms 20 (*a*), 20 (*b*), and 20 (*c*)), village by village, and also in drawing up village reports and correcting village maps.

11. Now, as before, the absence of the managers or of some efficient and duly empowered agent on their behalf, causes serious delay and inconvenience. The local agents have apparently no power to settle disputes amicably, although their disposition to protract matters is notorious.

II.—Panchberria.

12. The settlement of this mehal (area 1,603 bighas) has been carried out within the half-year under report. The mehal consists of the village Panchberria and 53 detached pieces of land situated in 10 of the neighbouring villages, the area of the largest piece being 331 bighas, and that of the smallest 6 cottahs. The proceedings were held on the spot and occupied four days. The status, existing rents, and other particulars regarding the holdings (225 in number, including under-tenures) were recorded, and 23 disputes as to the amount of the existing rent, rent-free title, status, &c., were disposed of summarily. The Raj estate applied for settlement of fair rents against 89 of the tenants separately, all the cases being then and there disposed of by amicable arrangement.

13. This is the first settlement done on the lines proposed by you and approved of by the Board in their No. 404A, dated the 17th April 1891, to your address, and I believe it has proved a complete success. This result is due solely to the presence and co-operation of the Assistant Manager, Mr. Srinath Dutta.

14. The draft records of Panchberria have been published under section 105(1) and the period of one month after the date of such publication has expired. The Raj estate has filed no objection or dispute case, but the tenants have put in—

1 Objection under section 105 (1); 7 disputes under section 106; 2 applications to set aside the orders made in 2 out of the 89 cases under section 104 (2). Five of these cases were disposed of before the end of last month, and the rest were decided on the 3rd instant. The effect has been the revival of one of the 89 suits for settlement of fair rents. Barring possible appeals, the disposal of this case is the only thing that remains to be done in connection with Panchberria.

III.—Chandnihat.

16. The settlement of this insignificant mehal (area 12 bighas) was completed during the half-year. As there was no application for settlement of fair rents, the existing rents only were recorded and the proceedings terminated. In your No. 1048T.A., dated the 7/5th July 1891, to the address of the Commissioner of the Burdwan Division, you were pleased to agree with me that a survey and record of rights of petty scattered areas of this kind should not be asked for.

Miscellaneous.

17. The costs incurred have been as follows:—

Period.	Heads of expenditure.	Amount.	Total.	Remarks.
		Rs. A. P.	Rs. A. P.	
Commencement to 13th October 1889.	Pay of Settlement Officer, Babu Benode Behari Sarkar and establishment.	...	2,401 1 6	No settlement work done.
14th October 1889 to 31st March 1890.	Pay of Settlement Officer and establishment.	...	2,940 4 9	
During 1890-91 ...	Ditto, ditto ...	...	8,132 14 3	
1st April 1891 to 30th September 1891.	Settlement Officer's pay	2,048 13 0		
	Ditto, travelling allowance.	66 0 0		
	Establishment ...	1,828 2 6		
	Contingencies ...	82 15 6		
	Forms and stationery ...	28 5 0		
	Furniture repaired ...	4 0 0		
	Office house-rent ...	34 15 6	4,093 3 6	
	Total ...	...	17,574 8 0	

18. I have considerably reduced my office establishment according to the present requirements of my work. My office now consists of—

1 English clerk.		1 Orderly.
1 Record-keeper.		2 Peons.
1 Muharrir.		1 Durwan.
	1 Duftry.	

19. I have taken up the ordinary duties of a Deputy Magistrate and Deputy Collector at the sudder station of Birbhum, in addition to my settlement duties from the 3rd September last.

20. I have been in camp for 17 days only during the half-year. It will be seen that the principal work done was the fair-copying and distribution of khatians; and that there has been very little occasion for me to leave head-quarters. My present criminal and collectorate duties will, however, interfere with my plans should any occasion arise for a local enquiry.

21. I beg to annex hereto four tabular statements, showing the work done by me up to the 30th September last.

Statement showing progress made in Burdwan Raj Khas Mehal Estates in Record of Rights and Settlement of rents up to 30th September 1891.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which record of rights has been completed: Up to 31st March 1891.	Number of villages in which record of rights has been completed: During the half-year under report.	Total number of raiyats in the villages in column 4.	Number of ryots whose rent had been recorded and status determined: Up to 31st March 1891.	Number of ryots whose rent had been recorded and status determined: During the half-year under report.	Number of ryots whose rent had been recorded and status determined: Total of columns 8 and 9.	Total rental of tenants whose rents have been settled: According to new settlement.	Total rental of tenants whose rents have been settled: According to previous jamabandi.	Total rental of tenants whose rents have been settled: Increase.	Total rental of tenants whose rents have been settled: Decrease.	Holdings of which a record has been prepared, but which cannot be shown in the prescribed forms: Lakheraj.	Non-rent paying.	Begari.	Chakaran.	Khatian slips prepared under paragraph 56, Chapter XI of Board's Survey Manual.	Appertaining to other estates.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
										Rs. A. P.	Rs. A. P.	Rs. A. P.								
Burdwan...	Birbhum	Hukumapur	88	88	...	2,201	2,201	...	2,201	13,668 0 0	11,685 0 0	1,980 0 0	Nil	588	131	187	107	432	58	Owing to the lands of one holding being situated in more villages than one, there are 3,040 khatian slips in Hukumapur, although they represent 2,201 *mal* holdings only, as shown in column 7.
		Panchberria	1	...	1	193	...	193	193	1,245 0 0	1,127 0 0	118 0 0	Nil	11	1	1	3	13	3	
		Chandnihat	1	...	1	16	...	16	16	6 13 8	6 13 8	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	
		Total ...	90	88	2	2,410	2,201	209	2,410	14,919 13 8	12,818 13 8	2,101 0 0	Nil	599	132	188	110	445	61	

Statement showing the Burdwan Raj Khas Mehal Estates under survey and settlement of rent during the half-year ending 30*th September* 1891.

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed: Up to 31st March 1891.	Area surveyed: During the half-year under report.	Area surveyed: Total area surveyed.	Number of villages of which the records have been handed over by the survey to the Settlement Officer: Up to 31st March 1891.	Number of villages of which the records have been handed over by the survey to the Settlement Officer: During the half-year under report.	Total cost up to— 31st March 1891: Survey.	Total cost up to— 31st March 1891: Settlement.	Total cost up to— During the half-year under report: Survey.	Total cost up to— During the half-year under report: Settlement.	Total cost up to— Total: Survey.	Total cost up to— Total: Settlement.	Rate per acre— Survey.	Rate per acre— Settlement.	Increase of rent— Actually obtained.	Increase of rent— Expected.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
				Acres.		Acres.	Acres.	Acres.			Rs.	Rs.	Rs.		Rs.		Rs. A. P.	Rs. A. P.			
Burdwan	Birbhum	Hukumapur.	88	15,586·69	By professional survey party.	15,586·69	109·00	15,695·69	88	Nil	8,020*	13,481	Not known.	4,093	8,020	17,574	0 7 11	1 1 3	1,980	...	* The actual cost of survey is unascertainable. The figure in column 12 is arrived at by calculating the average cost per acre on all the khas mehals surveyed taken as a whole. The total area of all khas mehals surveyed up to July 1891 was 243,272 acres.
		Panchberria.	1	411·64		411·64	118·33	529·97	1	Nil									118	...	
		Chandnihat.	1	3·96		3·96	Nil.	3·96	1	Nil									Nil	...	
		Total ...	90	16,002·29		16,002·29	227·33	16,229·62	90	Nil									2,098	...	

Statement of cases under sections 104 (2) *and* 106 *Bengal Tenancy Act, and under sections* 103, 108, *and* 623, *Civil Procedure Code.*

Period.	Number of applications under section 104 (2).			Number of objections under section 105 (1).			Number of disputes under section 106.			Number of applications under sections 103, 108, and 623, Civil Procedure Code.			Total of all cases.			Remarks.
	Filed.	Disposed of.	Pending.	Filed.	Disposed of.	Pending.	Filed.	Disposed of.	Pending.	Filed.	Disposed of.	Pending.	Filed.	Disposed of.	Pending.	
From commencement to 31st March 1891.	37	37	Nil	...	...	...	861	861	Nil	107	107	Nil	1,005	1,005	Nil	
From 1st April 1891 to 30th September 1891.	89	89*	Nil	1	1	Nil	10	8	2	7	7	Nil	107	105	2	* One revived—*vide* paragraph 14.
Total ...	126	126	Nil	1	1	Nil	871	869	2	114	114	Nil	1,112	1,110	2	

Statement of cases appealed under section 108 *of the Bengal Tenancy Act.*

	Filed.	Decreed		Decreed *ex parte*.	Remanded.	Dismissed.	Pending.	Remarks.
		Wholly.	Partly.					
Against orders under section 104 (2) ...	12	Nil	3*	1	Nil	8	Nil	* These cases were partly decreed in terms of *solahnamahs*, or agreements filed by the parties. The appeals were dismissed as regards those tenants who did not file *solahnamahs*.
,, ,, ,, ,, 106 ...	18	1	Nil	1	1	11	4	.....
,, ,, in miscellaneous suits ...	8	Nil	2*	Nil	1	5	Nil	.....
Total ...	38	1	5	2	2	24	4	

S. HALDAR,

Settlement Officer.

APPENDIX N.

No. 345, dated Suri, the 9th November 1891.

From—Babu Sukumar Haldar, Settlement Officer, Burdwan Raj Khas Mehals,
To—The Director of the Department of Land Records and Agriculture, Bengal.

With reference to your Circular No. 15T.A., dated the 17th October 1891, I have the honour to submit the following annual report for the period 1st October 1890 to 30th September 1891, in connection with the settlement of Hukmapore in Birbhum.

2. A report for the year ending the 31st March 1891 was submitted to the Collector of Birbhum with this office No. 8, dated the 6th April 1891, and a report for the half-year ending the 30th September last has been submitted to you with this office No. 329, dated the 14th October.

3. Two other petty *mehals* in Birbhum have been settled during the year under report, but as the work in connection with them was done during the half-year ending the 30th September last, and has been described in my report for that period, I may as well confine myself in the present report to Hukmapore.

4. The area of the estate as professionally surveyed amounts to 15,695·69 acres, its recorded area according to the revenue survey being 15,491 acres. This discrepancy may be accounted for by the fact that the external limits of villages have not, in the present survey, been laid down by reference to the revenue survey maps, as also by disturbance of possession in the course of the last 40 years, and is also probably due to inaccuracies in the old survey. The former figure does not include an area of 216 acres claimed by the Raj in an application under section 106, Bengal Tenancy Act, as forming part of Hukmapore, but not yet adjudicated upon or surveyed. It, however, includes an area of 531·85 acres, which in consequence of enquiries into boundary disputes has been found to form no part of the Burdwan estate, and an area of 16 acres not yet adjudicated upon.

5. The records of Hukmapore contain 37,387 khasra entries and 4,618 khatian slips. A tabular classification of the latter is annexed.

6. Hukmapore was surveyed at the end of 1888; no settlement officer was appointed till January following, and no settlement work was done till the middle of October 1889 when I was placed in charge.

7. I took charge of the settlement office on the 14th October 1889, and completed by the 31st March following a draft record of the particulars required to be recorded under notification dated the 24th September 1889, published in the *Calcutta Gazette* of the 25th September (Part I, pages 807-808). Applications for enhancement and additional rent were made by the Raj, most of them being filed after the expiry of the period fixed under rule 16 of Chapter VI of the Government rules. The tenants of certain groups of villages were joined together as defendants in 37 suits under section 104 (2) which covered the entire tenantry of Hukmapore. All these suits were contested by the tenants, who filed written statements in answer to the claims put forward by the Raj.

8. The following plan was laid down by you for settlement of rents:—"Mr. Reily will obtain from the settlement officer copies of khatians of villages of which the records have been made over to the settlement officer, and see if he can effect an amicable settlement of rents with the ryots. If so, he should report the arrangements which he proposes to make..... If Mr. Reily and the ryots do not come to an amicable arrangement as to what are to be entered as fair rents, then the settlement officer will proceed to settle fair rents according to the principles laid down in sections 27, 30 to 36, 38, 51 and 52 of the Tenancy Act."—(Memo. on Survey and Settlement of Burdwan Khas Mehals, dated Suri, the 20th August 1889). The Manager accordingly asked me for copies of the khatians in April 1890, and previous to doing so, reported certain proposals for introducing soil-class rates which received the approval of the Board of Revenue. Strong hopes of an amicable settlement in these terms were entertained till the end of October 1890, when the Manager reported (Manager's No. 742K, dated $\frac{\text{31st October}}{\text{1st November}}$ 1890, to the Collector of Birbhum) that the tenants had played false with him. Meanwhile Mr. Reily had been asking me demi-officially to push on with the cases, while his local agents were continually applying for adjournments on the ground (among others) that an amicable settlement was being arranged. These local agents were never prepared to produce evidence, and complained of the difficulty in obtaining witnesses in consequence of a hostile combination of the tenantry. Taking these circumstances into consideration, and holding that an amicable adjustment was desirable in the interests of all concerned, I held the cases over until about the middle of November, when the Manager's No. 742K just referred to came into my hand. The Manager about the same time deputed an officer with full powers and definite instructions to treat with the tenants. This was a wise step, and it helped me more than anything else in getting through my work. It was between November 1890 and February 1891 that the settlement cases were disposed of, although one case was settled in July and four more between that month and October 1890.

9. My work up to October 1890 was to write up the records for publication under section 105 (1). The survey records with which I had to deal showed the entire area of Hukmapore as "rent-paying" and almost the whole external boundary of the estate as "disputed." Before the drafts could be published, I had to dispose of 949 claims to

hold land as part of other zamindaries, as rent-free or at a fixed rent, or as *chákarán*, &c. This I did in the first instance summarily in the manner laid down in paragraph 4 of Appendix D of the Board's *Settlement Manual*. The records had to be amended in accordance with the decisions arrived at in these cases, as also according to 374 lists of discrepancies noted by the attestation amins under paragraph 2 of Appendix D of the *Manual*. These lists were abnormally heavy in consequence of the *khanapuri* having been made by amins unacquainted with the local language, and also because the tenants often did not attend on them to point out the limits of their holdings. The homestead sites were originally clubbed together, a detailed survey was made by the Burdwan detachment of the Survey of India, and the records were received by me in July 1890. These had to be worked into the original khatians before draft publication, which work was completed on the 17th August 1890.

10. Matters stood thus till the end of September 1890. Only five cases under section 104 (2) embracing 129 tenants and 318 out of 846 dispute cases filed under section 106 were disposed of up to the end of that month. By the end of February last all the 37 applications for the settlement of fair rents had been disposed of, and at the end of March 1891 the entire file of dispute cases under section 106 had been cleared.

11. Two of the cases under section 104 (2) were tried *ex parte*, as the tenants, after filing written statements contesting the claim of the zamindar-plaintiff to enhancement and additional rent, did not appear at the trial; three cases were practically withdrawn by the pleader for the Raj estate on the ground that the lands in question formed the *debottar* property of an idol; nine were dismissed under sections 102 and 158 of the Code of Civil Procedure; the habitual neglect of the Raj agents in appearing and in producing evidence being a source of constant annoyance to me and of hardship to the opposite parties, and rendering the adoption of such procedure necessary. The rest of the cases were tried and decided according to law, a considerable number of the tenents filing *solehnamahs* or agreements by amicable arrangement with the Raj. These *solehnamahs* were not drawn up in accordance with Mr. Reily's terms, but stipulated as follows:—

(1) An allowance of 3 cottah per each standard bigha in calculating areas of holdings.
(2) Acceptance of patnidar's papers (showing areas and rentals) and kabuliyats as correct.
(3) Assessment of excess areas (if any) at the average rate payable for the rest of the holding.
(4) Amicable adjustment of the petitions filed by the Raj estate under section 106 disputing the right of the tenants to hold lands rent-free.

After a searching examination of all the records in March last, you were satisfied as to the *bona-fide* character of these *solehnamahs*. On that occasion you recorded the following observation:—

"If the principle of compromise which was ultimately adopted had been put forward at the beginning, it is probable that it would have been readily accepted by the ryots, that the settlement proceedings would have been completed in a shorter time, and that much expense and labour would have been saved."

These words exactly express my own view of the matter. If a duly qualified officer with full powers and instructions had been deputed by the Manager in October 1889 instead of 12 months later, the result would certainly have been most satisfactory. As a fact, the affairs of the estate in connection with the settlement were left in the hands of a number of inefficient subordinate officials. These men were vested with no powers (wisely as I think) to treat with the tenants, so that in each case reference had to be made to the Manager, who was away at Burdwan, or in some remote part of the Burdwan estate. As regards those tenants who did not file agreements, I put the Raj as plaintiff to strict proof of the grounds of enhancement and additional rent claimed. As a result no enhancement was decreed by me. The Raj produced measurement papers and kabuliyats obtained from the late patnidar to prove its claim to additional rent under section 52 (1) *a*. In some cases these papers were not proved and were not admissible in evidence. These cases were dismissed, the existing rents being adhered to. In some cases the papers produced were proved by competent witnesses. The evidence adduced clearly proved that the previous measurements were made with a cubit of 19½ inches, and the areas were consequently calculated according to that standard. Such calculation showed excess area in the majority of cases; in a few instances it showed deficiency, and in fewer instances it showed no alteration of area. Where excess area was proved, evidence was forthcoming that the excess consisted of new lands encroached upon by the tenants such lands being designated *noabadi* or "newly cultivated," and the prevailing rate for such lands being proved to vary in different villages from 4 annas to 10 or 11 annas per bigha. The excess areas were assessed accordingly. The tenants have not appealed against such assessment. When the evidence proved deficiency in area, abatement was allowed, in the absence of proof of the yearly value of the land lost, according to the latter portion of section 52 (4) of the Bengal Tenancy Act. No alteration in rent was made in those cases in which no alteration in area was proved. The result of the settlement has been an increase of Rs. 2,073 over the previous jamabandi.

12. Not the least portion of my work was the disposal of 861 "dispute" cases under section 106 filed up to March last,—539 of them being contested and tried as civil suits. Most of these were merely revivals of the 949 cases I had summarily disposed of under

paragraph 4 of Appendix D, and were filed by the Raj. At various stages in the course of trial the Raj agents withdrew or abandoned 135 of the cases. Of the rest, 66 were dismissed under sections 102 and 158 of the Civil Procedure Code. The Agents applied under section 103 of the Civil Procedure Code for orders to set aside the dismissals under section 102. They eventually withdrew 26 of these applications after notices were served on the defendants, as provided in section 103, Civil Procedure Code. These circumstances are mentioned to show the haphazard manner in which the cases were conducted, and the trouble it entailed on me by compelling me to go over the same ground several times. All this would not have happened if a competent man had been on the spot to represent the Manager from the beginning. In Hukmapore the plaints under section 106, Bengal Tenancy Act, were received on plain paper. The new rule by which court-fee stamps of the value of 8 annas are to be levied on such applications is likely to have a salutary effect in checking indiscriminate institutions of the kind referred to.

13. Matters stood as follows at the end of March 1891 :—

All applications for settling fair rents having been disposed of, and all disputes of the nature mentioned in section 106 of the Bengal Tenancy Act having been decided, all that remains to be done is to finally frame the records in accordance with the result of these applications and disputes, and cause them to be published under section 105 (2). The records of 11 villages have already been published ; those of 5 are entirely, and of 17 are partly ready for publication.

14. The work here described as outstanding was finished on the 30th June 1891, on which day the records of the last of the 88 villages were finally published under section 105 (2), Bengal Tenancy Act.

15. In addition to this, all the khatians have been fair copied. During your inspection you recommended the condemnation of the originals owing to their blotched and dirty appearance. Three copies had thus to be made,—one for the collectorate, the second for the landlord, and the third for the tenants. Forty-five of the original khatians, however, were considered by me to be good enough for the collectorate record-room; of these I have caused only two sets of copies to be prepared. Some difficulty was experienced in obtaining the services of intelligent copyists at the contract rates sanctioned under the Board's rules. Before the copyists got accustomed to the work, little progress was made, as much of the work done by them had to be condemned. Besides a thorough comparison of all fair copies with the originals by muharirs employed for the purpose at the contract rates, I have, to ensure accuracy, caused a careful recomparison of over 25 per cent. of the khatians to be made by muharrirs of the regular establishment. As far as I am able to judge, the fair copies prepared are correct.

16. The records of 87 villages were made over to the Collectorate on and within the 5th September. The Raj estate got copies of the records of these 87 villages by the 11th September. Two thousand five hundred and fifty-four tenants received their khatian slips up to the 30th September. That the rest (about 745 in number) are yet unprovided for is owing to their own indifference in the matter, for the khatian copies of these holdings are long ready in office, and notices of distribution have been issued, village by village.

17. Besides the 861 cases under section 106, referred to in paragraph 12, 3 more cases were instituted by the Raj later on, claiming certain unsurveyed areas as part of Hukmapore. Of these, one has been disposed of and two are pending.

18. During the period under report I have been in camp for 84 days.

19. The costs incurred have been as follows :—

Period.	Heads of expenditure.	Amounts.	Total.	Remarks.
			Rs. A. P	
Commencement to 13th October 1889.	Pay of Settlement Officer, Babu Binod Behary Sirkar, and establishment.	...	2,401 1 6	No settlement work done.
14th October 1889 to 31st March 1890.	Pay of Settlement Officer and establishment.	...	2,947 4 9	
1st April 1890 to 31st March 1891.	Ditto ditto ditto ...	...	8,132 14 3	
1st April 1891 to 30th September 1891.	Settlement Officer's pay ...	2,048 13 0		
	Ditto travelling allowance ...	66 0 0		
	Establishment pay	1,558 7 3		
	Contract copyists	269 11 3		
	Contingencies	82 15 6		
	Forms and stationery	28 5 0		
	Repairing furniture	4 0 0		
	Office house rent	34 15 6	4,093 3 6	
	Grand Total ...	...	17,574 8 0	

20. The records of the last (88th) village have since been made over to the Collectorate.

21. Five tabular statements are annexed to this report.

I.—A Statement of Khatians.

Serial No.	Description of khatians.	Number of holdings.	Area in bighas.	Remarks.
1	Raiyats at fixed rates ...	18	1,374	Cottas and chitaks are omitted in the fourth column.
2	Settled raiyats	1,283	13,873	
3	Occupancy	42	478	
4	Non-occupancy	91	579	
		1,434	16,304	
5	Rent-free	588	3,968	
6	Khatians of parts of holdings lying in different villages	839	6,604	There are six collection circles in Hukmapore comprising 22 real villages. These have been surveyed as 88 villages. Hence, the lands of a single holding often lie in more villages than one.
7	Begar or service-tenures ...	187	36	
8	Non rent-paying squatters ...	129	245	
9	Waste lands &c., entered as the proprietor's khas.	438	17,333	
10	Chaukidari lands	107	717	
11	Government roads, &c. ...	59	164	
12	Lands appertaining to other zamindaries.	60	1,668	
13	Under-raiyats	777	[2,075]	The total of the fourth column does not include the figures placed within brackets.
	Total ...	4,618	47,049	

II.—Statement showing Progress made in Burdwan Raj Khas Mehal Estates in record of rights and settlement of rents up to 30th September 1891.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which record of rights has been completed— Up to 31st March 1891.	During the half-year under report.	Total number of raiyats in the village in column 4.	Number of raiyats whose rent had been recorded and status determined. Up to 31st March 1891.	During the half-year under report.	Total of columns 8 and 9.	Total rental of tenants whose rents have been settled. According to new settlement.	According to previous jamabandi.	Increase.	Decrease.	Holdings of which a record has been prepared, but which cannot be shown in the prescribed form. Lakhiraj.	Non-rent-paying.	Begari.	Chakran.	Khatians prepared under paragraph 56 of Chapter XI of Board's Survey Manual.	Appertaining to other estates.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
										Rs. A. P.	Rs. A. P.	Rs.								
Burdwan...	Birbhum...	Hukmapore ...	88	88	...	2,211	2,211	...	2,211	13,758 0 0	11,685 0 0	2,073	..	592	131	187	107	432	59	
		Panchberia ...	1	...	1	193	...	193	193	1,245 0 0	1,127 0 0	118	...	11	1	1	3	13	3	
		Chandinhat ...	1	...	1	16	...	16	16	6 13 8	6 13 8	Nil	...	...	...	...	...	...	...	
		Total ...	90	88	2	2,420	2,211	209	2,420	15,009 13 8	12,818 13 8	2,191	...	603	132	188	110	445	62	

Owing to the lands of one holding being situated in more villages than one, there are 4,618 khatian slips in Hukmapore, although they represent 2,211 mál holdings as shown in column 7.

III.—Statement showing the Burdwan Raj Khas Mehal Estates under survey and settlement of rent during the half-year ending the 30th September 1891.

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed. Up to 31st March 1891.	During the half-year under report.	Total area surveyed.	Number of villages of which the records have been handed over by the survey to the settlement officer— Up to 31st March 1891.	During the half-year under report.	Total cost. Up to 31st March 1891. Survey.	Settlement.	During the half-year under report. Survey.	Settlement.	Total. Survey.	Settlement.	Rate per acre. Survey.	Settlement.	Increase of rent— Actually obtained.	Expected.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
				Acres.		Acres.	Acres.	Acres.			Rs.	Rs.		Rs.	Rs.	Rs.	Ans.	Rs. A. P.	Rs.		
Burdwan.	Birbhum.	Hukumapore...	88	15,586·69	Profes-sional.	15,586·69	109·00	15,695·69	88	...	8,020	13,481	...	4,093	8,020	17,574	7½	1 1 3	2,073	...	
		Panchberia ...	1	411·64		411·64	118·33	529·97	1	...									118	...	
		Chandinhat ...	1	3·96		3·96	...	3·96	1	...									...	...	
		Total ...	90	16,002·29	...	16,002·29	227·33	16,229·62	90	...									2,191		

The actual cost of survey is unascertainable. The figure in column 12 is arrived at by calculating the average cost per acre on all the khas mehals surveyed taken as a whole. The total area of all khas mehals surveyed up to July 18 1 was 243,272 acres.

IV.—Statement of cases appealed under section 108, *Bengal Tenancy Act.*

	Filed.	Decreed		Decreed *ex-parte*.	Remanded.	Dismissed.	Pending.	Remarks.
		Wholly.	Partly.					
1	2	3	4	5	6	7		9
Against orders under section 104(2)	2	...	3*	1	...	3	...	
Ditto ditto ditto 106 ...	18	1	...	1	1	11	4	
Ditto in miscellaneous suits	8	...	2*	...	1	5	...	
Total ...	38	1	5*	2	2	24	4	

* These cases were partly decreed in terms of *solehnamahs* or agreements filed by the parties. The appeals were dismissed as regards those tenants who did not file *solehnamahs*.

V.—Statement of cases under sections 104(2) *and* 106, *Bengal Tenancy Act, and under sections* 103, 108 *and* 623, *Civil Procedure Code.*

Period.	Number of applications under section 104(2).			Number of objections under section 105(1).			Number of disputes under section 106.			Number of applications under sections 103, 108, and 623, Civil Procedure Code.			Total of all cases.			Remarks.
	Filed.	Disposed of.	Pending.	Filed.	Disposed of.	Pending.	Filed.	Disposed of.	Pending.	Filed.	Disposed of.	Pending.	Filed.	Disposed of.	Pending.	
From commencement to 31st March 1891	37	37	...	...	...	...	861	861	...	107	107	...	1,005	1,005	...	
From 1st April 1891 to 30th September 1891	89	89*	...	1	1	...	10	8	2	7	7	...	107	105	2	
Total ...	126	126	...	1	1	...	871	869	2	114	114	...	1,112	1,110	2	

* One revived.

S. HALDAR,
Settlement Officer.

APPENDIX O.

No. 296, dated Kajlagar, the 2nd October 1891.

From—D. L. Roy, Esq., Settlement Officer, Sujamutha Estate,
To—The Director of the Department of Land Records and Agriculture, Bengal.

I HAVE the honour to submit to you the progress report for September 1891, and the half-yearly report for the period from the 1st April 1891 to the 30th September 1891.

I.

Statement showing progress made on record of rights and settlement of rents for the half-year from **1st** *April* **1891** *to* **30***th September* **1891.**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
							NUMBER OF VILLAGES IN WHICH RECORD OF RIGHTS HAS BEEN COMPLETED.			NUMBER OF RAIYATS WHOSE RENT HAD BEEN RECORDED AND STATUS DETERMINED.			TOTAL RENTAL OF TENANTS WHOSE RENTS HAVE BEEN SETTLED.				COST.		
DIVISION.	District.	Name of estate.	Number of towjis in the estate.	Number of acres in the estate.	Number of field plots in the estate.	Total number of villages.	Up to the 31st March 1891.	During the half-year under report.	Total number of raiyats in the villages in column 7.	Up to the 31st March 1891.	During the half-year under report.	Total of columns 11 and 12.	According to settlement.	According to previous jamabandi.	Increase.	Decrease.	Survey.	Settlement— Up to the 31st March 1891.	Settlement— Up to the end of the half-year under report.
Burdwan ...	Midnapore ...	Sujamutha ...	7	28,864½	79,659	66	35	31	12,152	3,914	8,238	12,152	Rs. A. P. 80,917 14 5	Rs. A. P. 86,105 11 5	Nil	Rs. A. P. 5,187 13 0	Rs. A. P. 1,07,000 0 0*	Rs. A. P. 10,279 11 0	Rs. A. P. 14,810 7 3

REMARKS.

The total number of villages in the pargana is 72, of which 6 do not belong to the Burdwan Raj and have been struck off from settlement. Of the 66 villages wherein rents have been settled, the cases in 5 have been decided by contested suits before me, where enhancement of rents was given by me for excess area over 25 per cent. of the previous recorded areas. The raiyats have appealed in 3 out of these 5 cases, which are pending before the Appellate Court. They object to the settlement proceedings altogether. In the case of 8 villages my decisions have been upset by the Special Judge, who assessed all excess areas over 10 per cent. at the existing rates. The suits regarding the other villages have been compromised, the existing rents being agreed upon as fair. Twenty-seven of these compromises have not been as yet worked out by the landlord, the other 26 having been worked out by me. The working out is necessary (1) on account of there being different tauzis and revenue-free lands in the villages and the compromises filed not containing the information; (2) on account of there being several old tenants not recorded in the landlords' papers, which show the tenants who existed about 20 years ago, the transfers not being recorded therein. The landlord is now finding out these transfers and filing statements to show them. The tauzis had not been noted by the survey party at the time of the survey. They are doing it now. So the rental shown here as obtained by settlement shows and includes the rents *as originally reduced* by me for deterioration in these 27 villages, and not the rents as now agreed to as fair before the Appellate Court. Thus the actual rental obtained by the settlement will be much more than what is shown here.

* This cost is for the survey of all the Burdwan estates up to the end of October 1890, no separate account being kept of the survey of the Sujamutha estate. The Survey has been done by the Survey of India party. No cost seems to have been incurred since October 1890.

D. L. ROY,
Settlement Officer.

II.

I have got no assistant settlement officer under me; so the work shown in statement I represents the work as done by me alone. My head-quarters are at present in Kajlagar in the centre of Sujamutha. They were temporarily in Midnapore during a part of summer and the rainy season last year (from 1st June to 23rd September 1890, *i.e.* for nearly 3½ months). I was absent from Kajlagar during the half-year under report on duty for 47 days, exclusive of halts within five miles of Kajlagar (the number of such halts being 25 days).

III.

(*a*) No demarcation papers have been received by me from the Survey Department. I believe no demarcation proceedings were undertaken in this pargana. No demarcation was made within the period under report.

(*b*) (*c*) (*d*) The survey and the khanapuri had been finished, and all the records had been received from the Survey Department before the period under report. The traces and khasras, however, of 31 villages have been sent back to the Survey Department for correction as to tauzi. None of these have yet been returned to me.

(*e*) The cause of delay in this settlement has been explained by the Director of Land Records in his inspection note, and by the Board in their letter No. 375A, dated the 13th April 1891. I have nothing to add just now except that I recommended the compromise on the very terms on which they have been concluded now at the very beginning of this settlement, in my first letter to Mr. Reily. If the recommendation had then been accepted by Mr. Reily and the records been properly prepared by the Survey Department, this settlement had long been over, and much of the cost could have been saved.

(*f*) No fresh assessment of land records is being made.

IV.

No steps have yet been taken to train the local officials. It is intended at the conclusion of the settlement to teach the landlords' gumáshtas the rudiments of practical surveying.

KAJLAGAR,
The 2nd October 1891.

D. L. ROY,
Settlement Officer.

APPENDIX P.

No. 329, dated Kajlagar, the 7th November 1891.

From—D. L. Roy, Esq., Settlement Officer, Sujamutha Estate,
To—The Director of the Department of Land Records and Agriculture, Bengal.

With reference to your telegram, dated the 4th instant, received yesterday evening, I have the honour to submit to you the annual report for the year ending 30th September 1891, as directed.

2. As this report, as well as the report for the half-year ending 30th September, have have had to be prepared in a hurry, in my anxiety to submit the latter within the time prescribed by Government, and the former as soon as possible after the receipt of your telegram, I have had to remain satisfied with giving in both of them very little more than the information required by the Government and you; reserving a fuller report, with the explanations which I have to submit regarding the settlement of rents in this pargana, for my final report, which will, I expect, soon have to be in the course of preparation.

Statement No. I for the year ending 30th September 1891.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Division.	District.	Name of estate.	Number of tauzis in the estate.	Number of acres in the estate.	Number of field plots in the estate.	Total number of villages in the estate.	Number of villages in which records of rights have been completed—		Total number of raiyats in the pargana (column 7).	Number of raiyats whose rents had been recorded and status determined.			Total rentals of the tenants whose rents have been settled.				Cost.			Remarks.
							Up to 30th September 1890.	During the year under report.		Up to 30th September 1890.	During the year under report.	Total.	According to settlement.	According to previous jamabandi.	Increase.	Decrease.	Survey.	Settlement.		
																		Up to 30th September 1890.	Up to the end of the half-year under report.	
Burdwan	Midnapore	Sujamutha	7	28,864½	79,659	66, exclusive of 6 lákhiraj villages not belonging to the Burdwan Raj.	34	32	12,152	3,534	8,618	12,152	Rs. A. P. 80,917 14 5†	Rs. A. P. 86,105 11 5	Nil	Rs. A. P. 5,187 13 0	Rs.	Rs. A. P. 5,849 15 6	Rs. A. P. 14,810 7 3	

The remarks made in this column in the Statement 1 of the report for the half-year ending the 30th September 1891 hold good with regard to this statement as well. The number 7 in column 4 represents the number of tauzis only of the mal portion of the pargana, not of the lákhiraj portion. The cost of survey shown in column 18 is of the survey of all the Burdwan estates surveyed, no separate account having been kept for the Sujamutha survey by the Survey Department.

Note.—This is the rental according to Mr. Dwijendra Lal Roy's settlement which was reversed on appeal and not according to the terms of compromise.

Statement No. II for the year ending 30th September 1891.

I have got no Assistant Settlement Officer under me, so the work shown in Statement I represents the work as done by me alone. My head-quarters during the year under report has been in Kajlagar. I have been out on duty during the year under report for 65 days, exclusive of halts within 5 miles of Kajlagar, but not in Kajlagar.

Statement No. III.

(*a*) No demarcation papers have been received by me, though I enquired of the Survey Department, the landlord (Mr. Reily), and of the Collector of Midnapore. No demarcation work was done during the period under report. The Survey Department are now correcting the boundaries of many villages, which shows the boundaries of villages as first laid down by them, on which they based the survey, to have been wrong. I therefore believe that no demarcation work was properly done on the survey of the pargana if done at all. This is unfortunate, as the alteration of the village boundaries now by the Survey Department is causing much additonal work in this office.

(*b*) The survey had been finished in the pargana before my arrival here.

(*c*) The records of 72 villages in the pargana (66 mal and 6 lákhiraj) had been all received before the period under report. The khasras and traces of 50 villages are now with Survey Department who are noting the tauzis therein and correcting the boundaries of the villages.

(*d*) The khanapuri had also been finished before the year under report.

(*e*) During the year under report the rents of tenants had all been fixed by agreement of the parties, The existing rents had been determined before the settlement of rents by me.

(*f*) No fresh assessment of land revenue is being made.

Statement No. IV.

No steps have yet been taken to train the local officials. It is intended to teach the gumáshtas the rudiments of surveying at the end of the settlement.

D. L. ROY,

Settlement Officer.

APPENDIX Q.

No. 444, dated Kajlagar, the 8th February 1892.

From—D. L. Roy, Esq., Settlement Officer, Sujamutha Estate,
To—The Director of the Department of Land Records and Agriculture, Bengal.

In reply to your telegram dated the 1st February, I have the honour to submit a concise account of the work done during the year ending the 30th September 1891, in addition to the statements already submitted.

2. If any statements are found to be unsatisfactory in any way, please point out to me the portion of the report which appears to you defective and what further information you require, as, never having had the opportunity of writing reports before, I may have blundered in some way or other. And I will thereon forthwith submit either the necessary explanation or report.

Preliminary.—The records of 34 villages, besides of six non-rent paying ones, had been made over to me on my arrival to Kajlagar as Settlement Officer, *i.e.*, on the 10th February 1890. The attestation work and the settlement work regarding all these villages were completed by the end of May 1890. The months of June, July, August, and a part of September were employed in disposing of applications and suits under section 106 of the Bengal Tenancy Act, in completing the correction of the records for errors as found on application by the raiyats filed after attestation, and in the preparation of the jamabandis and decrees regarding the 34 villages according to my decisions in the settlement suits. Seven hundred and twelve such applications were disposed of either summararily or by framing them into suits, as circumstances required. It is a singular fact that none of these applications, as far as I can see from the register of applications, was filed by the landlord who reserved his objections till after the publication of the draft records.

Progress during the year ending September 1891.—The records of the remaining 32 villages were made over to me by the Survey Department in the following order :—

Month.	No. of villages made over to me therein.
May	7
June	11
July	8
October	6
	32

Notices were issued for the settlement of rents in these villages, and the settlement work regarding these villages was taken up in the middle of September 1891, the work of attestation having been commenced a month before its being redone in my presence. There were disputes affecting 3,330 holdings filed before me at the attestation, which were decided by me, resulting in the correction of the records affecting 2,628 raiyats and 9,265 plots. There were besides survey errors regarding 208 holdings and 1,446 plots.

After deciding these disputes I took up the settlement suits which had been instituted ont applications by the landlord. I was hearing these suits regarding the 32 villages simultaneously with carrying on a correspondence with Mr. Reily for affecting an amicable settlement between the landlord and the raiyats. Several proposals were made, and Mr. Reily was prevailed upon to agree to certain terms which he had proposed at the beginning of the settlement, the essence thereof being that the survey areas be assessed at the existing rates after a deduction therefrom of 25 per cent. He, however, at last withdrew these terms and proposed fresh ones which the raiyats would not accept.

Things had reached this stage when His Honour the Lieutenant-Governor of Bengal visited Midnapore, and after inspection of the work proposed that the landlord should not look for an enchancement of rents in the present condition of the raiyats. Mr. Finucane visited Sujamutha on the 20th March, and after local inspection recommended to the Board the compromise on the basis on which I had so long been vainly trying to bring about an agreement. Lala Ban Behary Kapar was directed by the Board to come to Sujamutha to give effect to the compromise recommended by Mr. Finucane. He came here in April and went away after filing in general terms agreements with the raiyats, the essence of which was that the existing rents be held as fair, leaving it to me to work out the compromises as to each individual raiyat in a form which he gave to me. The compromises were written and filed without any reference to me and without showing them to me before.

Dated the 2nd May 1891.

I wrote to the manager demi-officially, pointing out the vagueness and incompleteness of the compromises, in reply to which he said that he framed the compromises as he thought fit and I might reject the compromises if I liked, and left Sujamutha.

I wrote to the Collector demi-officially about it in my letter dated the 13th June 1891, but I got no reply. I began, however, to work out the compromises as best I could, utterly

unhelped by the Sub-Manager, who said in petitions with some raiyats that he was prepared to help me if I followed the plan of working them out in the form laid down by the Manager. This was in a manner dictating to me the course I should adopt, as it implied that unless I did so the Sub-Manager *would not* help me in working out the compromises, as was evidently his duty to do, irrespective of the course I was adopting, which if he or the Manager did not approve of he might represent to the Director in the meantime. This I believed was unreasonable, the more so as the working out of the compromise in the manner indicated was very little necessary, and that too for the purpose of enabling the zaminder to object to subdivisions of holdings to which he ought never to have thought of objecting at all in a case like the present. This course too was altogether impracticable, as the identification of nearly 80,000 survey plots with zamindary chitta plots would be herculean work and could not be done in a reasonable time, as is proved by the fact of the landlord's having been doing this work with an average of 15 well-paid amins for nearly eight months and not yet half finishing the work.

On the 25th June I saw Mr. Finucane in Calcutta and related to him the whole case. He asked me to go with him to Burdwan to meet the Manager, which I accordingly did. There at the Conference he entirely agreed with me regarding the incompleteness of the compromises and the cumbrousness of the form in which the landlord proposed that they should be worked out, laying down at the same time that it was not sufficient for the landlord to file compromises in general terms, and that it was the landlord who should work out the compromises, in which view the Commissioner agreed. It was also arranged that the Survey Department would now note the tauzis in the khasras and mark them on the traces, and that I should then enter them in the khatians.

The landlord now took up the working out of the compromises and the Survey Department took up the work of entering the tauzis in the records. I was at the same time helping the landlord with a part of my establishment in preparing the latwari rent statements and deciding suits and freshly raised disputes, and was having the records as complete as they could be before publication, viz. completing the correction of the records for errors, writing up the Kachemehal customs in each khatian as required, and the filling up of the blank columns of the khatians, which had hitherto been left blank. This work was continued up to the end of September 1891.

Analysis of the months and the nature of work in each.

October 1890.
November 1890.
December 1890.
January 1891.
February 1891.
March 1891.

1. The work of attestation regarding the 32 villages obtained afresh from the Survey Department.

2. The work of the publication of the draft records of the 34 villages settled during the previous working season (January to May 1890), the completion of which records for publication had been done during the hot and the rainy seasons (June to the middle of September 1890).

3. The deciding of numerous disputes raised on attestation.

4. The correction of the records for the errors either admitted or found to be so on my settling the disputes raised.

5. The hearing of the suits for settlement of rents regarding these 32 villages.

6. Attempts being made in bringing out an amicable settlement.

April 1891.
May ,,
June ,,

1. The settlement of disputes raised by means of application after attestation regarding these 32 villages.

2. The disposal of the objections raised by the landlord or the raiyats after the publication of the draft records of the 34 villages settled last year.

3. Preparation of the rent-rolls regarding the 32 villages according to agreements filed by the landlord and the raiyats.

July 1891.
August ,,
September ,,

1. Helping the landlord in the preparation of the rent-rolls as arranged by the Director.

2. The continuance of the correction of the records and the disposal of objections. Writing up certain village histories which it had been omitted to do before.

3. Filling up of all the columns of the khatians which had been left blank as far as they could be filled up before publication regarding all the 66 villages.

Analysis of the amount of work done during the year ending September 1890.

1. Settlement of disputes regarding 3,330 holdings raised on attestation.

2. Correction of the records affecting the holdings of 2,628 raiyats and 9,265 plots for errors found in deciding the disputes.

3. Correction of the records for survey errors affecting 208 holdings and 1,446 plots.

4. Disposal of 1,010 applications and 239 suits.

5. Correction of records for orders passed in disposing of the applications and suits.

APPENDIX R.

No. 11R, dated Calcutta, the 11th January 1892.

Memo. by—Lieut.-Colonel C. Strahan, R.E., Deputy Surveyor-General, in charge Revenue Branch, Survey of India.

Forwarded in original to the Director of the Department of Land Records and Agriculture, Bengal, for information, with reference to his No. 1818T.A., dated 16th November 1891.

Report on the operations in the Burdwan Raj Estate during Survey year 1890-91.

This detachment was to have been absorbed into No. 8 Party (Orissa), but owing to representation made by the Manager, Burdwan Raj Estate, it was decided to retain the services of Mr. Shaw and a small staff for a further period of one year.

The work allotted was—

(*a*) Relaying of old thakbust boundaries in district Bankura of 21 mauzas admitted by the Manager to have been leased in patni.

(*b*) The cadastral survey of all lands in district Burdwan that had been omitted from measurement during previous seasons.

Field office was opened at Raniganj on the 20th December 1890, and until the arrival of instruments on the 5th January 1891, the necessary comparison of old revenue survey maps, thakbust maps, and boundary surveys executed in 1889-90 were being undertaken prior to starting the demarcation in district Bankura.

The relaying of boundaries of the 21 mauzas was completed on the 20th January. The demarcation of each village was tested by independent surveys of the boundaries of each mauza on the 4″ scale. The salient points on the boundaries of the mauzas so relaid were marked by 400 drainage pipes, of 3″ diameter, obtained from Messrs. Burn and Company of Raniganj. The cost of the pipes, as well as the cost of embedding them, was borne by the Raj management, and forms no part of the amount shown as survey expenditure, although the work was done by the detachment.

Much unsatisfactory delay was caused in starting the field-by-field survey of lands omitted during previous operations owing to the ignorance of the Raj officials about the situation and extent of the lands to be measured. The lands are very much scattered, and are situated in 99 villages extending from Culna on the Hooghly river to Sainthia station on the East Indian Railway loop line.

The average size of the blocks measured is 4·73 acres only and that of the fields 0·34 of an acre.

The cost of surveying such small and scattered areas has necessarily been high, being Re. 1-4 an acre, including maps, records, traces, &c.

The lands were known to be situated in nearly 100 villages, but as they were pointed out for measurement in a most desultory manner by the tahsildars, it was not known what the area would ultimately prove to be. The lands, too, are situated in villages not in khas possession, and tenants were with difficulty got to attend for the necessary entries in the khasras.

The cost and difficulties of this work cannot, therefore, be gauged by those of similar operations in other parts of the country.

The following statement shows the outturn of cadastral survey during the season under report:—

	Number of villages.	Number of blocks.	Number of fields.	Area in acres.	Average size of block.	Average size of field.
			District Burdwan.			
Scattered lands ...	38	284	5,328	1,769	6·2	0·33
Omitted lands ...	51	251	1,763	741	2·9	0·42
			District Birbhum.			
Scattered lands ...	9	49	296	134	2·7	0·45
Omitted lands ...	1	1	638	125	125·0	0·20
Total ...	99	585	8,025	2,769	4·73	0·34

Note.—Scattered lands are situated in villages not surveyed.
Omitted lands are situated on the boundaries of mauzas surveyed in 1888, 1889, and 1890.

The measurement of the smaller blocks and isolated fields was tested by an Inspector in the field, while through the larger blocks test lines were run after receipt of the maps in office.

During recess the work undertaken by the detachment was somewhat different from that usually performed by cadastral parties.

In district Midnapore the Burdwan Raj owns 66 villages, which constitute pargana Sujamutha. These villages, however, although all belonging to the Raj, are made up of 13 different tauzis or properties, seven paying revenue to Government and six revenue-free.

The Manager pointed out at the meeting on the 30th June, previously alluded to, that these had all been measured as one estate, and that the record of rights had been similarly treated. It was necessary, he said, to have these separate tauzis marked on the survey maps and the khatians corrected to agree with the maps. The Manager further brought to notice that the boundaries as pointed out by the Raj officials at the time of cadastral survey in 1888-89 did not in all cases correspond with the boundaries as they existed at the time of thakbust survey in 1854, and that the zamindari papers were based on limits of villages as they existed at this latter mentioned period.

The old boundaries were consequently entered on the original plans and on the traces supplied to the Settlement Officer and the Manager. The different tauzis were also shown on the traces by means of distinguishing colours in accordance with the thakbust maps.

This method of showing different tauzi on the traces, as also revenue-free, ghatwali, and other lands marked on the thakbust maps, was extended to districts Burdwan and Bankura, the old thakbust boundaries being likewise shown on the traces.

Although in district Burdwan the boundaries of mauzas now pointed out differ in many places from the old boundaries, yet the number of mauzas has remained the same, but in district Bankura very few indeed of the mauzas now recognised on the ground correspond with those shown on the old revenue survey and thakbust maps. The comparison of boundaries and colouring of tauzis in district Burdwan have all been completed; and it was anticipated that the same would have been done for all the mauzas of Bankura, but the difficulties in this district were greater than was expected. The mauzas are so mixed up that portions of six, seven, and sometimes ten original villages now go to form one village as lately pointed out to the surveyors.

The following statement shows the number of village traces to be compared and coloured and the number actually completed up to date of report:—

District.	Total villages.	Compared and coloured.	Remaining.
Burdwan ...	62	62	...
Sujamutha, Midnapore	66	66	...
Ditto ...	2	...	2
Bankura ...	366	150	216
Hooghly ...	24	...	24
Nadia ...	1	...	1
Total ...	521	278	243

For district Midnapore the khasras, safawar, and milan khasras of 62 villages have also been corrected to agree with the map and corrected records of 56 villages returned to the Settlement Officer.

The rectification of boundaries in Sujamutha has involved correction of the following:—

(*a*) Original field plans.
(*b*) Two sets of traces.
(*c*) Offsets in village traverse tables.
(*d*) English area statement.
(*e*) Khasras.
(*f*) Safawar and milan khasras.

The work remaining for this detachment during 1891-92 is:—

(1) Cadastral survey of lands gazetted in November 1889, but not carried out through want of demarcation.
(2) Cadastral survey of lands gazetted on 11th November 1891.
(3) Cadastral survey of lands already gazetted, but found on comparison of old and recent maps to have been omitted from measurement, either through ignorance on the part of the Raj officials or connivance on their part with opposing interests.
(4) Traverse survey of tauzis Nos. 1, 2 and 3, district Bankura, area about 650 square miles.

The Manager has sent up a proposal for a Survey Training School, and this will probably be opened during the coming field season.

With reference to surveys done by this detachment, the Director of Land Records, Bengal, in his Annual Report for 1890-91, writes thus:—

"The present Manager, Lala Bun Behary Kapur, reports that the work done is valuable to the Raj, that he has been enabled to resume possession of some of the missing villages, and that though opposed to the undertaking of the survey at the beginning, now asks for the extension of it to touzis 1, 2 and 3 of the Bankura district."

Camp Bishnupur,
The 9th January 1892.

THOMAS SHAW,
Offg. Surveyor, Survey of India, in charge Burdwan Detachment.

SURVEY OF INDIA DEPARTMENT.

No. _____ Party (Burdwan Detachment) for Season 1890-91.

Table showing Distribution of Charges among different Description of Survey and the Cost Rate of each Description.

Description of Work.	District.	Scale.	Totals of monthly allotments to sections.	Shares of charges for general sections.	Shares of pay and travelling of Deputy Superintendents and Assistant Superintendents.	Special contingent charges.	Shares of general contingent charges.	Total.	Area.	Cost Rates.			Remarks.
										Per sq. mile.	Per acre.	Per field.	
			Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A.	Sq. Mls.	Rs.	As.	As.	
Completion of previous season's records.	.....	...	3,313 0 0	1,495 0 0	...	...	218 14 0	5,026 14	...	...	...	...	No cost rates can be given.
Relaying of boundaries	Bankura ...	...	2,661 0 0	1,189 0 0	...	...	174 3 0	4,014 3	...	...	...	...	
Detail survey ...	Burdwan ... Birbhum	16"	1,524 0 0	676 8 0	...	...	105 0 0	2,307 8	4·33	532·9	13·3	4·6	
Khanapuri (ro of rights)	Ditto ...	...	544 0 0	258 0 0	...	...	31 12 0	833 12	4·33	192·5	4·8	1·7	
Statistics													
Completion of maps and records.	Ditto ...	...	205 3 9	97 7 9	...	...	17 4 6	320 0	4·33	73·9	1·8	0·6	
Copying thakbust maps.													
Comparison of maps, old revenue survey thakbust and present survey.	Midnapore Burdwan ... Bankura ...	...	3,602 0 0	1,593 8 0	...	...	234 3 0	5,429 11	...	...	...	...	Ditto.
Colouring of tauzis, revenue-free and other lands on cadastral traces.													
Correction of original 16" plans.													
Correction of khasras, &c., to agree with old boundaries.	Midnapore ...	...	712 0 0	295 0 0	...	...	43 0 0	1,050 0	...	...	...	...	Ditto.
Total ...	.....	...	12,551 3 9	5,606 7 9	...	...	824 4 6	18,983 0	...	...	...	...	

Camp Bishnupur,
The 9th January 1892.

THOMAS SHAW,
Offg. Surveyor, in charge Burdwan Detachment.

APPENDIX S.

No. 87.

Statement showing the estates under survey and settlement of rentals during the half-year ending 30th September 1891.

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed.			Number of villages of which the records have been handed over by the Survey to Settlement Officer.		Total cost up to—						Rate per acre.		Total rentals of tenants whose rents have been settled.				Remarks.
						Up to 31st March 1891.	During the half-year under report.	Total area surveyed.	Up to 31st March 1891.	During the half-year under report.	31st March 1891.		During the half-year under report.		Total.				According to new settlement.	According to previous jamabandi.	Increase.	Decrease.	
											Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Chittagong ...	Tippera ...	Sarail	299	1,80,664	By professional agency.	Acres. 180,664	Nil	Acres. 180,664	216	64	Rs. 85,366	Rs. 8,356	Rs. 8,829	Rs. 5,177	Rs. 99,158	Rs. 13,533	Rs. A. P. 0 8 9	Rs. A. P. 0 4 6	Rs. A. P. 92,871 6 2	Rs. A. P. 75,994 15 6	Rs. A. P. 16,876 6 8	...	
						Spent through Settlement Officer ...					4,963	...	...	...	...	...	...	...	...	...	...	...	
Total ...	.....	...	...	...	.....	...	...	...	...	...	90,329	...	...	...	...	...	...	...	...	...	...	...	

N.B.—The figures showing area and cost do not agree with those supplied by Mr. Grant, the Deputy Superintendent in charge of the Survey Party. The Settlement Officer has been requested to explain them.

M. F.

Explanation sheet attached to the half-yearly progress report of survey and settlement work of pargana Sarail during the half-year ending 30th September 1891.

Table or Statement.	Heading.	Column.	Explanation.
Half-yearly progress report of survey and settlement of pargana Sarail during the half-year ending 30th September 1891.	Rate per acre Settlement.	19	As the survey party did not make over the papers of a single village for the 1st six months, I virtually did no settlement work during that period. If my pay and allowance for that period, amounting to Rs. 3,000, be deducted from the total cost, the cost of settlement per acre would come up to 3¼ annas per acre, and not 4¼ annas as shown in the return. I have substituted the last four columns of the return in Appendix B, namely, the rentals of tenants according to present and previous jamabandi in place of the last two columns of Appendix A, as they relate to revenue only, referred to in the Government letter No. 455T.R, dated 24th September 1891.

Brahmanbaria,
The 7th October 1891.

KALI SANKAR SEN,
Settlement Officer of Pargana Sarail.

APPENDIX T.

No. 88, dated Brahmanbaria, the 28th October 1891.

From—Babu Kali Sankar Sen, Settlement Officer of Pargana Sarail,
To—The Director of the Department of Land Records and Agriculture, Bengal.

With reference to your circular No. 15T.A., dated 17th instant, I have the honour to submit the annual report of survey and settlement of the Sarail estate for the period 1st October 1890 to 30th September 1891.

2. From the two statements submitted herewith, it will appear that the total area under survey was 180,664 acres, consisting of 299 villages. The survey was commenced with by a detachment of Party No. II of the Survey of India in the month of November 1889, and up to the month of September 1890 the party finished the whole of the traverse survey, 165,882 acres of kistwar survey, and completed the khanapuri or record writing with respect to 125,696 acres. The Survey Department not having made over to me the papers of a single village during the first six months of the operations, I virtually did no settlement work during the period. Up to the 30th September 1890, they sent to me the records of 31 villages only, comprising an area of 3,378 acres. Out of these 31 villages, the records of 26 villages having been received in the month of September 1890, the settlement operation actually began in November 1890. During the last 12 months, that is, from 1st October 1890 to 30th September 1891, I recorded the rights and settled fair rents of 15,773 tenants holding an area of 37,089 acres. The villages I have settled contain a total number of 20,864 tenants, out of whom the rents of 5,091 tenants have not been settled, as they have no direct relation with the Court of Wards, but hold lands under patnidar and other proprietors.

3. The effect on the zamindar's rent-roll by the settlement of the above villages has been an increase of rent to the extent of 22·2 per cent. The increase is, however, liable to alteration, and is likely to be reduced after the publication of the draft jamabandi and disposal of objections under sections 105 and 106 of the Tenancy Act. The increase is chiefly due to the excess quantity of lands found in the possession of raiyats by the encroachment of fallow lands. In assessing rents on excess lands, an allowance of 3½ gandas per kani, or about 17 per cent., has been made in favour of raiyats for ails of fields and close measurement. In a very small number of instances the rate of rent has been enhanced to the prevailing rate after personal local enquiry and satisfactory evidence adduced by the landlord.

4. The total cost of survey up to 30th September 1891 has been Rs. 99,158, out of which Rs. 27,876 was spent during the last 12 months. The settlement expenses from 1st October 1890 to 30th September 1891 have been Rs. 10,533, and the area settled 47,002 acres, so that the average rate per acre for the last 12 months has been found to be 3 annas 7 pie per acre. In villages which still remain to be settled, the bulk of the attestation work has been completed, so that at the close of the settlement proceedings the rate per acre for the whole work is likely to be considerably reduced. The sum of Rs. 3,000 spent up to the 30th September 1890 for settlement expenses in fact went for nothing, the actual settlement operations not having begun before October 1890, owing to the non-receipt of papers from the Survey Department.

5. So far the settlement work has proceeded without any hitch, and both the landlord and tenants seem to be satisfied with the proceedings. I, however, had to undergo great difficulties in making settlement owing to the numerous inaccuracies which had crept into the survey papers, the khatians not having been locally compared by the Survey Department in the presence of raiyats and landlords' agents. The pargana consists of three large zamindaris and a large number of small revenue-paying and revenue-free estates the lands of which are intermixed almost in every village. The Survey Department having measured the lands of one estate as appertaining to another, great pains had to be taken in correcting the mistakes.

6. Another difficulty met with while proceeding with the settlement work is the great variety of rates in the same village. A village is generally divided into five or six bandas or patches of land, and sometimes more, and in each banda different rates* are found to prevail. With a view to determine rents, it was found necessary to ascertain the rate payable by raiyats for every plot of land in the same banda,† which was a tedious task and occupied a good deal of time.

* This is not what I was told on the spot.
M. F.

† Why necessary to do this.
M. F.

Return showing the progress of survey work in the Sarail Estate for the period 1st October 1890 to 30th September 1891.

Total area in acres of the estate under survey.	Total number of villages under survey and settlement.	Area in acres surveyed cadastrally.			Number of villages of which records were made over to Settlement Officer—			Approximate area in acres of which the records have been made over to the Settlement Officer.			Number of villages of which survey records are still due to Settlement Officer.	Approximate cost of survey and settlement up to date.					Area in acres remaining to be surveyed.	Area in acres remaining to be settled.	Remarks.
												Survey.		Settlement.					
		Up to 30th September 1890.	From 1st October 1890 to 30th September 1891.	Total.	Up to 30th September 1890.	From 1st October 1890 to 30th September 1891.	Total.	Up to 30th September 1890.	From 1st October 1890 to 30th September 1891.	Total.		Up to 30th September 1890.	From 1st October 1890 to 30th September 1891.	Up to 30th September 1890.	From 1st October 1890 to 30th September 1891.	Total.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
664	299	Kistwar 165,882 Khanapuri 125,696	Kistwar 14,782 Khanapuri 54,968	180,664 180,664	31	249	280	3,378	125,349	128,727	19	Rs. 66,319 4,963 Spent through Settlement Officer	Rs. 27,876	Rs. 3,000	Rs. 10,533	Rs. 112,691 Total 71,282	...	133,663	

Statement showing the progress made in record of rights and settlement of rents during the period 1st October 1890 to 30th September 1891.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
				Number of tenants whose rents have been recorded, status determined, and whose fair rents have been settled—			Classification of tenants included in column 7.						Total rentals of tenants whose rents have been settled—			
Period to which the figures refer.	Number of villages of which records received from the Survey Department.	Tota area of villages included in column 2.	Number of raiyats in the villages included in column 2.	Up to 30th September 1890.	From 1st October 1890 to 30th September 1891.	Total of columns 5 and 6.	Number of cultivating tenure-holders and under-tenureholders.	Area cultivated by them.	Number of raiyats at fixed rate.	Area held by them.	Number of settled raiyats.	Area held by them.	Number of occupancy raiyats, but not settled raiyats.	Area held by them.	Number of non-occupancy raiyats.	Area held by them.	Number of under-raiyats.	Area held by them.	According to settlement.	According to previous jamabandi.	Increase.	Decrease.	Remarks explanatory of increase and decrease.
													Rs.	Rs.	Rs.			
Up to September 1890 ...	31	3,378	1,724	...	15,773	15,773	714	6,642	...	...	15,059	30,447	...	...	...	...	1,221	739	92,871	75,995	16,876	...	The area actually settled is 37,089 acres, to which is to be added 9,913 acres, which are either khas patit or belong to landlords other than the Court of Wards, so that the total area of the villages settled is 47,002 acres.
From 1st October 1890 to 30th September 1891	249	125,349	57,577																				
Total ...	280	128,727	59,301	...	15,773	15,773	714	6,642	...	...	15,059	30,447	...	...	...	...	1,221	739	92,871	75,995	16,876	...	
Add the number of tenants holding lands under patnidars and proprietors other than the Court of Wards in villages settled from 1st October 1890 to 30th September 1891				...	5,091	5,091																	
Total ...				...	20,864	20,864																	

KALI SHANKAR SEN,

Settlement Officer of Pargana Sarail.

APPENDIX U.

No 171, dated Marsaghai, the 9th October 1891.

From—Babu Chandra Nath Ghose, Settlement Officer, Kujang,
To—The Director of the Department of Land Records and Agriculture, Bengal.

In accordance with the instructions conveyed in Government Circular No. 455TR, dated 24th September 1891, I have the honour to submit the following report with statements A and B regarding the settlement operations of killa Kujang for the half-year ending 30th September 1891.

The settlement of killa Kujang is made amicably, and the principle which is assumed in adjusting the rent is a calculation of the village rates of rent on the land ascertained by measurement by 20 dusty podika in which a mân is equal to ·73 of an acre, found in occupation of a tenant, with the several kinds of crops, reference being at the same time had to the description of tenure under which the land is held and cultivated. This, together with the class of soil as ascertained, forms the basis of assessment of rent of the raiyati tenures in the estate.

The substitution of 20 dusty podika for that of 16 dusty, throughout the estate except Chokra, under Board's order, had caused a reduction in the rental in proportion to the decrease in the area of the holding. The jamabandies made out on this procedure had, however, to be overhauled and corrected, in accordance with the instructions subsequently received.

There are certain class of lands called palandas. These palandas are sold every year by auction to the highest bidders, who sublet them to the raiyats for cultivation as well as for pasturages after the crops are reaped. Many of these palandas have been brought under cultivation by the tenants for more than five years, who got their names noted in khasra. These lands were settled with the raiyats under the orders of the late Manager, Mr. Reily. But as the rent so assessed was found to be less than the amount realizable by the palandas being put to auction as usual, the lands in question have, under the orders of the present Manager, been shewn in the name of the Raj estate. The former rental has therefore been noted in khatian as the present rent.

These circumstances necessitated a revision of most part of my works, which took a long time during the half-year.

No attempt has been made to resume the lákhiraj tenures that are entered in the landlord's register or in the road cess paper. I settled only such lands as rent-free as are noted in the register supplied to this office by the Sub-Manager, the figures of which tally with those of the first road cess return of 1280, the excess lands being resumed. The service tenures were settled according to the utbati paper received from the Sub-Manager's office. It was not necessary, therefore, to go into details of such tenures.

During the half-year under review, my time was mostly devoted to settling the rent-free tenures and in recording the rent of the under-raiyats in the khatian, most of whom cultivate lands of the lákhirajdars on the half-produce system. There was much of miscellaneous work besides, connected with the revision of the jamabandies and the preparation of fresh statements, in which all of my subordinates had been employed during the latter three months of the period under report. Early part of the half-year the muharrirs were employed in preparing jamabandies and in helping me in taking signatures of the raiyats in khatian and the amíns in checking classification of soil and correcting khasras and khatians.

My English staff consisting of two clerks was fully engaged, one being in charge of the correspondence, whilst the other constantly accompanied me in my tours for the Bench work, and prepared the different periodical returns and statements. The bulk of the work having run short, the services of one of them was dispensed with from the 1st June last.

My head-quarters is at Marsaghai, a place within the estate under settlement, where there is a tahsil cutcherry. I was away from it on tour for 97 days during the half-year.

A.

Statement showing the Estates under Survey and Settlement of Revenue during the half-year ending 30th September 1891.

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed.			Number of villages of which the records have been handed over by the Survey to the Settlement Officer.—		Total cost.						Rate per acre on the area cadastrally surveyed and settled up to 30th September 1891.		Increase of Revenue.—		Remarks.
						Up to 31st March 1891.	During the half-year under report.	Total area surveyed.	Up to 31st March 1891.	During the half-year under report.	Up to 31st March 1891.		During the half-year under report.		Total.		Survey.	Settlement.	Actually obtained.	Expected.	
											Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Orissa ...	Cuttack	Kujang	461	144,960	Professional agency.	144,960	Nil	144,960	459	2	Rs. 60,635	Rs. A. P. 15,775 10 11	Rs. A. P. 13 0 0	Rs. A. P. 5,496 6 9	Rs. A. P. 50,648 0 0	Rs. A. P. 21,272 1 8	0 5 6	0 2 7	Rs. A. P. 7,192 2 3	Rs. A. P. 1,500 0 0	

B.

Statement showing progress made in Government Estates and Temporarily-settled Tracts in Record of Rights and Settlement of Rents up to the 30th September 1891.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which Record of Rights has been completed—		Total number of raiyats in the villages in column 4.	Number of ryots whose rent had been recorded and status determined.			Total rental of tenants whose rents have been settled.				Remarks.
				Up to 31st March 1891.	During the half-year under report.		Upto 31st March 1891.	During the half-year under report.	Total of columns 8 and 9.	According to new settlement.	According to previous jamabandi.	Increase.	Decrease.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Orissa ...	Cuttack ...	Kujang ...	461	...	...	36,104	14,512	18,991	33,503*	Rs. A. P. 1,15,248 4 2	Rs. A. P. 1,08,056 1 11	Rs. A. P. 7,192 2 3	...	

* This includes 3,000 under-ryots, some of whom pay rent in half-produce system and the others pay Rs. 2,400 in cash, which is not included in the amounts shown in columns 11, 12 and 13.

KUJANG SETTLEMENT OFFICE,
The 9th October 1891.

C. N. GHOSE,
Settlement Officer.

APPENDIX V.

No. 199, dated Kujang, the 17th November 1891.

From—Babu Chandra Nath Ghose, Settlement Officer, Kujang,

To—The Director of the Department of Land Records and Agriculture, Bengal.

In obedience to your orders communicated to me by your telegram which reached me yesterday, I have the honour to submit the following report showing the progress of work done from 1st October 1890 to 30th September 1891.

During the year under review the rent of 28, 841 tenants and 3,000 under-raiyats, most of whom cultivate lands under half produce system, was recorded, leaving 7,014 to be dealt with in the following year. The entire 146,804 acres were surveyed previous to the year under report, but the khasras and khatians of all mouzahs were not prepared and made over to this office till the year in question.

There were six cases of boundary disputes pending in my office from the previous year and four cases were instituted during the year. Out of these 10 cases, nine were decided and one pending at the close of the year. Besides these, 2,738 cases relating to the mutation of names, classification of soil, riyati tenures claimed as rent-free, and about title of rent-free tenure-holders were disposed of.

I was away from the head-quarters for 181 days during the period under report.

I have completed the settlement of killa Kujang, and am now arranging the records and drafting the completion report, which I hope to finish soon.

No. 222, dated Kujang, the 11th January 1892.

From—Babu C. M. Ghose, Settlement Officer, Kujang,

To—The Director of Land Records and Agriculture, Bengal.

In obedience to your order of the 8th instant, which reached me this morning, I have the honour to submit herewith the annual statements A and B.

A.

Statement shewing the Estates under Survey and Settlement of Rent during the year from 1st October 1890 to 30th September 1891.

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional party.	Area surveyed—			Number of villages of which the records have been handed over by the Survey to the Settlement Officer—		Total cost.						Rate per acre on the area cadastrally surveyed and settled up to 30th September 1891.		Increase of revenue—		Remarks.
						Up to 30th September 1890.	During the year under report.	Total area surveyed.	Up to 30th September 1890.	During the year under report.	Up to 30th September 1890.		During the year under report.		Total.				Actually obtained.	Expected.	
											Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
						Acres.		Acres.			Rs. A. P.	Rs. A. P.	Rs.	Rs. A. P.	Rs.	Rs. A. P.	A. P.	A. P.	Rs. A. P.	Rs. A. P.	
Orissa	Cuttack	Kujung	461	146,856·37	Professionally.	146,856·37	Nil	146,856·37	447	14	49,108 0 0	10,963 2 11	1,540	10,308 14 9	50,648	21,272 1 8	5 6	2 7	7,192 2 3	1,500 0 0	

Camp Cuttack;
The 11th January 1892.

C. N. GHOSE,
Settlement Officer, Kujang.

B.

Statement shewing the progress made in Government Estates and temporary settled Tracts in Record of Rights and Settlement of Rents from 1st October 1890 to 30th September 1891.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which record of rights has been completed—		Total number of raiyats in the villages in column 4.	Number of raiyats whose rents had been recorded and status determined—			Total rental of tenants whose rents have been settled—				Remarks.
				Up to 30th September 1890.	During the year under report.		Up to 30th September 1890.	During the year under report.	Total of columns 8 and 9.	According to new settlement.	According to previous jamabandi.	Increase.	Decrease.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
										Rs. A. P.	Rs. A. P.	Rs. A. P.		
Orissa ...	Cuttack	Kujung	461	98	348	36,104	4,662	28,841	33,503*	1,15,248 4 2	1,08,056 1 11	7,192 2 3	...	* This includes 3,000 under-raiyats, some of whom pay rents in half-produce system and the others pay Rs. 2,400 in cash, which is not included in the amounts shown in columns 11, 12, and 13. The settlement operation was commenced in July 1889, but the work of settlement of rent was not taken up till 21st July 1890, for the reasons stated in the Annual Report.

CAMP CUTTACK;
The 11th January 1892.

C. N. GHOSE,
Settlement Officer, Kujang.

APPENDIX W.

No. 115, dated Gánja, the 7th October 1891.

From—S. S. Hossein, Esq., Settlement Officer of Kanika,

To—The Director of the Department of Land Records and Agriculture, Bengal.

I have the honour to submit half-yearly Progress Report, No. II, for the period ending with 30th September 1891, as called for in Government letter to the Board of Revenue, No. 455TR, dated Darjeeling, the 24th September, copy of which was demi-officially received on the 1st instant.

2. As this is the first half-yearly report, it would not be improper to give a brief account of work done in connection with survey and settlement up to the beginning of the period under report.

3. The estate has been under the management of the Court of Wards since 1864, and soon after it came under the Court, a regular settlement of it was taken in hand and completed in 1871. Since then there has been only a revision, which was made in 1880-81, and in which the new lands were assessed and the papers of 1865-71 copied. As about 20 years had elapsed since the settlement of 1865-71, a fresh settlement, with the help of professional survey, was decided upon in 1888, and the work of survey was commenced that year.

4. Before the traverse party came to the estate which it did in 1888, the demarcation work was completed and most part of the estate was traversed by May 1889. About 40 villages were also cadastrally surveyed before recess that year. Survey work was resumed from December 1889 and completed by June of the following year. The settlement work was entrusted to Mr. Datta, who joined this estate early in February 1890, and continued in this appointment till 14th May 1891. During this period of fifteen months he was able to do some preliminary work in connection with settlement and recorded rents of 7,957 tenants. The settlement of no single village was, however, finally completed by him, and even attestation of *lakhraj* and *tonki* numbers in most of these villages has not been done.

5. The total area of the estate according to present survey is 282,240 acres. The total area of 632 villages cadastrally surveyed is 177,920. The papers of 577 villages containing an area of 158,176 acres have been received, the details of which are given below:—

		Acres.
(*a*)	Cultivated and rent-paying raiyati	93,200
	„ permanent tenures at fixed rates	8,845
(*b*)	Rent-free	6,710
(*c*)	and Waste	49,421
	Total ...	158,176

6. Of the period under report, Mr. Datta was in charge of this settlement from 1st April to 14th May 1891, and from 15th May to 2nd July I was in charge of the office, pending receipt of orders about the appointment of Mr. Datta's successor. On 3rd July, orders of the Board were received, directing me to carry on settlement work in addition to management duties. To relieve me of management, an Assistant Manager has been appointed, who has joined since 28th July 1891

7. The amount of work done by Mr. Datta in April and May is shown in the annexed statement. Mr. Datta's diary-book not being in the office, an account of his touring cannot be correctly given. From the copy of his travelling allowance bills, however, it appears that he was out for 10 days in April and not in May. After Mr. Datta left, assessment work was stopped, but attestation was continued till 18th July, and during this period 101 villages were attested, containing 40,672 khasra entries, at a cost of Rs. 336-12-5. After 18th July the country was flooded and no attestation was possible. This work cannot be resumed much before December, as till then fields will mostly remain under water.

8. As stated above, I was in charge of the settlement from 15th May till the end of September, but till the receipt of orders on the 3rd July, I was principally employed on management duties. During the first period (15th May to 2nd July), I was out—

16 days in May,
19 „ in June,

and after the receipt of orders I was out—

22 days in July,
23 „ in August, and
5 „ in September.

In September I was not out on settlement duties. I had, however, to go to Cuttack in this month in connection with a civil suit. Almost the whole of this month I was employed on the preparation of rate statement and other office work.

9. An account of work done from 3rd July to 30th September is given in detail.

I. *Boundary disputes.*—Almost all along the exterior boundary there are petty disputes. These disputes cannot be decided under the Survey Act, as most of these refer to waste lands, and the fact of possession in case of such lands cannot be satisfactorily proved. I have therefore done my best to have these disputes amicably settled, and have fairly succeeded in doing so.

(1) The first dispute refers to the adjoining estate of Utikon.—The common boundary line between this estate and Kanika is 12 miles in length, and there were disputes here and there, all along the entire length of this line. The Utikon estate is a temporarily-settled estate, and it was measured and settled along with other estates in Orissa in 1842. Kanika estate is a permanently-settled estate, and it was measured in 1865-71. But this measurement was private, while that of Utikon, though of older date, was under Regulation VII of 1822. The Utikon estate claimed, and rightly claimed, that the boundary should be laid down according to Utikon papers, as these papers, were Government papers, and therefore more reliable than Kanika papers, which were private. The difficulty in conceding to this claim was that as no maps were prepared in 1842, and as considerable changes have taken place since the estate was measured, the boundary according to revenue papers could not be accurately determined. I had, however, the boundary as far as possible determined with the help of Utikon papers, authenticated copy of which was filed, and I spent more than a week in doing this measurement. The boundary finally adopted after lengthy correspondence is the one mainly based on the Utikon papers.

(2) With Aul Estate.—The dispute with this estate refers to the rivers Khursooa and Brahmini. It is admitted on both sides that these rivers belong to the two estates half and half. The difficulty, however, arises when we come to divide the rivers. The rivers are tidal, and therefore the level of the water is never constant. The Aul estate claims that the rivers should be divided at low water, and the Kanika estate claims half of the beds of the rivers at high water. If these rivers had not to be shown in the maps, a mere note, saying that the rivers belong to the two estates half and half, would have been sufficient. The Survey Act is of no help in this case, and the question at issue is merely a legal one.

The case has been pending since some time, and during this half-year it was taken up and postponed six times. The rivers have been shown by the survey party both as demarcated by the Aul people and as demarcated by the Kanika people, but the traces have not been signed by either party. I sent the traces to the Aul Raja, with request to sign the traces or to point out where his demarcation had not been followed. He has expressed his inability to do either, on the ground that neither he nor any of his men understand these things. The Aul Raja has, however, promised to get out a pleader, duly authorised, and it is hoped some amicable settlement will be arrived at in November next.

(3) With Ghattaper Estate.—There were disputes all along the common boundary line six miles in length. These have been amicably settled, as those with Utikon estate, after good deal of enquiries and measurement.

(4) With Barsinghpur.—Before the enquiries were completed the country was flooded, and the settlement of these disputes has been postponed to December next. In this case there will be no difficulty in coming to an amicable settlement, as the zamindar is the Government pleader of Cuttack. I have, however, first to ascertain the boundary according to last revenue papers, and this has partly been done, and part will be done in next cold weather.

(5) With Mahulia, killa Kaima.—This boundary has been verified, and the signature obtained from the proprietor on the trace in token of acceptance. Length of this boundary is one and one-third miles.

(6) With Mahulia Kanhapur, pargana Bhera.—This boundary too has been verified, and the zemindar has accepted and signed the trace. Length one mile.

(7) With Mahulia Bhatpara, pergunnah Kaima.—This dispute has been enquired into and will be decided next cold weather, as the fields are now under water. Length one-fourth mile.

II. *Attestation.*—The proper season for this work was over when I entered on my settlement duties. I did. however, as much as I could. I checked the attestation of 31 villages containing 15,087 khasra entries, and disposed of 1,103 disputes and objections.

III. *Peparation of rate statement.*—Soon after the receipt of the Board's No. 442A, dated 24th June 1891, directing me to take up settlement work of this estate, I was shown Board's No. 699A, dated 25th June, the 4th paragraph of which I beg to quote at this place:—

"Under all the circumstances of the case the Board are not prepared at present to approve the Settlement Officer's proceedings in respect of the 129 villages reported on by him, and they must await a further report after all the villages of the estate have been dealt with on the same principles as explained in parigraph 6 of your letter. Greater caution should, however, be used in raising lands from one class to another, and should it appear after a large number of new villages have been thus dealt with that the assessment in the 129 villages taken up by Mr. S. Datta should be somewhat lowered, a revision should be made. Until the further report has been received and orders have been passed on it by the Board, the final settlement of the villages should be kept in abeyance. The proceedings should now he pushed on rapidly in the remaining villages, and the report, desired by the Board submitted without avoidable delay."

In showing these instructions you were good enough to further explain them, and your instructions as contained in the printed inspection note are—

(1) "That a large enhancement in the rental of these estates is not desired, but only a moderate addition to the rental on the ground of extension of cultivation. The outlay on survey has been Rs. 66,254 to the end of June, Rs. 7,998 for settlement to 14th May. The total area of the estate is 282,240 acres, of which 177,920 acres were cadastrally surveyed; the rest is jungle. Mr. Sakhawat Hossein now estimates that the total cost of completion of the settlement will be Rs. 14,995, which added to the amount already expended on settlement and survey gives a total expenditure of Rs. 89,247.

A moderate return for this outlay at five per cent. would be about Rs. 5,000."

(2) "The second principle to be borne in mind is that multiplicity of rates which are now said to prevail should be reduced and lands should be assessed, so far as possible, according to the class of soil, at the rate which is generally paid at present for land of the class, after allowance of one-sixth for close measurements. The rate should be applied to areas of holdings, and should, according to the Board's orders, operate in reducing rents of individual holdings as well as in increasing them where the new area is more than one-sixth less than the old area. Fractions of an anna should be struck out of the rates, and in fixing the total rental of each holding, fractions of a rupee or less than four annas may be omitted. The Settlement Officer should show in his maps the lands included in each class to which a different rate is applied."

(3) "Expenditure incurred by the estate in keeping up bunds which were necessary for enabling cultivation to be carried on should not be taken as a ground for enhancing rents. The Board have pointed out that the cost of these bunds is the consideration which the landlord has to pay for receiving any rent in these parts."

In accordance with the above instructions, I have prepared a rate statement for 511 villages out of 577, of which papers have been received from the Survey Office. A copy of this statement which is under preparation will shortly be submitted. The result obtained in these 511 villages is an increase of Rs. 10,470-7-9 in the rental and 8,464·15 acres in area. The old area and rental of these 511 villages were 78,325·68 acres and Rs. 89,344-13-3, and the area and rental now obtained are 86,789·83 acres and Rs. 99,815-5.

The Board's instructions quoted above would explain why no actual settlement has been made by me. The Board have directed that until they have passed orders on this rate statement, final settlement of villages should remain in abeyance.

IV. *Miscellaneous.*—(*a*) Before I was shown Board's letter, paragraph 4 of which has been quoted, I had settled two villages, the result of which was shown to you when I had the pleasure of meeting you in Chandbali on 16th July last. This settlement was done at existing rates, but as the rates have now been revised and shown in the rate statement, the settlement of these villages will be revised. Only one village, Nooagan No. 400 of the rate statement, has been settled at the proposed rates. This was done before I had understood the Board's orders on this subject.

(*b*) Classification of soils was done in a few villages, but on reconsideration and with your sanction demi-officially given, it was decided to accept the survey work.

(*c*) Rough *terij* has been prepared for 47 villages. A specimen copy for village No. 2 of the rate statement is annexed to the rate statement.

10. Cost incurred during the half-year under report—

	Rs.	A.	P.
On settlement	1,995	1	7
Amount spent by Mr. Datta from 1st April to 14th May ...	1,026	12	9
Amount spent from 15th May to 18th July	619	14	6

	Rs.	A.	P.
(1) On attestation	336	12	5
(2) „ office work	180	10	7
(3) „ enquiries in connection with boundary disputes	102	7	6

Amount spent from 19th July to 30th September on rate statement and preparation of terij Rs. 348-6-4.

11. Before, concluding this report, I wish to add a few words in connection with the maintenance of records about which there has been some correspondence during the period under report. I have from the beginning been urging that the present mustajeri system should be remodelled in order that we might have better class of men who would be able to maintain and correct records and maps. Most of the present mustajirs are unfit for any but collection work; and this even they are not able to do satisfactorily. If the records are to be maintained with the greatest efficiency and with the least expense, it must be done by the collecting agency, and as the collecting agency in this estate is unfit for this additional work, it should be changed. Every attempt has been made to train up the present mustajirs in survey work, in order to fit them for the work of maintaining the records. Fourteen mustajirs and 103 relations of mustajirs alone have learned survey, and about 100 of these can do the work. The estate should either be settled with these 100 men as mustajirs, or a tahsildari system should be introdueed as has been done in the adjoining estate of Kujang, which is similarly situated and hitherto similarly managed.

A.

Statement showing the Estate under Survey and Settlement of rents during the half-year ending 30th September 1891.

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed (cadastrally).			Number of villages of which the records have been handed over by the survey to the Settlement Office.		Total cost up to—						Rate per acre.		Increase of Revenue.		Remarks.
											31st March 1891.		During the half-year under report.		Total.						
						Up to 31st March 1891.	During the half-year under report.	Total area surveyed.	Up to 31st March 1891.	During the half-year under report.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Actually obtained.	Expected.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
											Rs.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
Orissa	Cuttack	Kanika	632	2,82,240	Surveyed by professional agency.	177,920(*a*)	...	177,920	577	...	65,817	6,970 10 7	582 0 0	1,995 1 7	66,399 0 0	8,965 12 2	0 6 0	0 4 8	4,529 13 0	10,500 0 0	

(*a*) The survey of the estate has been completed. The area cadastrally surveyed has been shown in column 7, and the rest is jungle which has been surveyed 4 inches to a mile.

CXV

B.

Statement showing progress of settlement of rents made in Kanika Ward's permanently-settled Estate up to the 30th September 1891.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which rents have been recorded.		Total number of tenants in the villages in column 4.	Number of raiyats whose rents had been recorded.			Total rental of tenants whose rents have been settled.				Area settled.	Number of ryots who have not signed the khatians in token of their acceptance of rents recorded.	Remarks.
				Up to 31st March 1891.	During the half-year under report.		Up to 31st March 1891.	During the half-year under report.	Total of columns 8 and 9.	According to new settlement.	According to previous jamabandi.	Increase.	Decrease.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
										Rs. A. P.	Rs. A. P.	Rs. A. P.		Acres.		
Orissa ...	Cuttack	Kanika	632	178	20	32,098	6,738	1,219	7,957	33,427 11 7	28,897 14 7	4,529 13 0	...	30,912	2,434	

KANIKA SETTLEMENT OFFICE,
The 7th October 1891.

S. HOSSEIN,
Settlement Officer.

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APPENDIX X.

No. 140, dated Ganja, the 17th November 1891.

From—Syud Sakhawat Hossein, Esq., Settlement Officer of Kanika,

To—The Director of the Department of Land Records and Agriculture, Bengal.

Agreeably to your telegram dated the 4th instant (received on the 6th) and letter No. 1750TA, dated the 4th instant (received on the 9th), I have the honour to submit the following report on the progress of survey and settlement of the estate for the period 1st October 1890 to 30th September 1891.

2. A copy of Bengal Government letter No. 455TR, dated 24th September last, was demi-officially received on the 1st ultimo, and in accordance with the instructions contained therein, the report for the half-year ending 30th September last was submitted with this office No. 115, dated 7th ultimo. There was no mention made for submission of this annual report, and in fact the Government letter referred to above calls for no such report from the Settlement Officers. The circular No. 15TA, referred to in your telegram under reply, was received from the office of the Settlement Officer of Orissa only on the 7th instant, *i.e.*, after receipt of the telegram. Hence the annual report now called for could not be submitted earlier.

3. During the period under report, Mr. Datta was in charge of settlement of the estate from 1st October 1890 to 14th May 1891, when he left the estate and I was, pending appointment of a successor to Mr. Datta, put in charge of the Settlement Office. The Board's orders directing me to carry on settlement work in addition to management duties were received on 3rd July last, and since then I have been doing settlement work of the estate.

4. In the half-yearly report submitted with this office No. 115, dated the 7th ultimo, full details have been given of the settlement work during the period 1st April to 30th September 1891, and an account of work done during the 1st half-year, viz., 1st October 1890 to 31st March 1891, has been included in the annual report submitted by Mr. Datta with his No. 52, dated 20th April last, and as in these reports, viz., annual report No. 52, dated 20th April 1891, and half-yearly report No. 115, dated 7th October 1891, full information has been given, there is little left to be included in the annual report now called for. However, as a report has been called for, one is being submitted, giving a brief account of what has been done during the period 1st October 1890 to 30th September 1891.

5. The amount of touring done during the year under report is stated below:—

Up to 14th May 1891 Mr. Datta was out for—

0	days	in	October 1890,
0	„	„	November 1890,
1	day	„	December 1890,
18	days	„	January 1891,
27	„	„	February 1891,
17	„	„	March 1891,
10	„	„	April 1891,
0	„	„	May 1891,

and from 15th May I was out for—

15	„	„	May 1891,
19	„	„	June 1891,
22	„	„	July 1891,
23	„	„	August 1891, and
5	„	„	September 1891.
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In September 1891 I had to stay at head-quarters for a long time, as I was busy with office work in preparing the rate statement called for by the Board in paragraph 4 of their letter No. 699A, dated 25th June last.

6. A short account of work done during the period covered by the report is given below:—

From Mr. Datta's annual report No. 52, dated 20th April 1891 (paragraph 4), it is seen that by the end of March 1891 he was able to settle rents of 176 villages with the total area of 26,373 acres, and obtained an increase of about 15 per cent. over the old rental. Of these 176 villages, 80 were settled in March only. The progress in this month was much too rapid. The rest of his report describes his difficulties, his procedure of work, and other matters. The total quantity of settlement work done by the time he left the estate, viz., 14th May 1891, is shown in the statement B annexed to this report.

The work done since 14th May has been fully described in the half-yearly report recently submitted, and is only briefly noted here :—

Boundary disputes.—Most of the boundary disputes were disposed of during this period, and the external boundary line, 20½ miles in length, were settled.

Attestation.—It appears that 346 villages were partially attested by mohurirs in Mr. Datta's time, but how many of these were attested by him cannot be ascertained. Since 15th

May to 18th July 101 villages were attested, and of these I was able to check and complete attestation of 31 villages, containing 15,087 khasra entries, and dispose of 1,103 disputes and objections. This was done after I had met you in Chandbally in July last.

Rate statement.—From 20th July to 30th September I was principally employed in drawing up rate statement which has been sent up.

7. Mr. Datta submitted his first rate report, based on the results of 4 villages, with his No. 105, dated 12th—14th June 1890 His next report, based on the results of 29 villages, was submitted with this office No. 20, dated 3rd February 1891; and his third and last report, which was based on the results of 100 more villages, was submitted with No. 50, dated 16th—18th April 1891.

In their letter No. 699A, dated 25th June last, the Board directed me to submit a report for the whole estate on the principles laid down in paragraph 4 of their letter, and this report, based on the results of 511 villages, has been submitted with this office No. 116, dated 9th October last. Pending receipt of orders on this report, the final settlement of villages has been kept in abeyance as desired by the Board. The result obtained in these 511 villages is an increase of Rs. 10,470-7-9 in the rental and 8,464·15 acres in area. The old area and rental of these 511 villages were 78,325·68 acres and Rs. 89,344-13-3, and the area and rental now obtained are 86,789·83 acres and Rs 99,815-5 respectively.

8. The Board's instructions conveyed in their letter No. 699A, dated 25th June last, would explain why no rents have been recorded by me.

A.

Statement showing the Estates under Survey and Settlement of rents during the year ending 30th September 1891.

Division.	District.	Name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed (cadastrally).			Number of villages of which the records have been handed over by the survey to the settlement office—		Total cost—						Rate per acre.		Increase of rent—		Remarks.
						Up to 30th September 1890.	During the year under report.	Total area surveyed.	Up to 30th September 1890.	During the year under report.	Up to 30th September 1890.		During the year under report.		Total.		Survey.	Settlement.	Actually obtained.	Expected.	
											Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
						Acres.	Acres.	Acres.			Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	A. P.	A. P.	Rs. A. P.	Rs. A. P.	
Orissa ...	Cuttack	Kanika ...	632	282,240	Professional ...	1,63,630	14,290	177,920*	440	137	60,226 0 0	3,297 0 0	6,173 0 0	5,668 12 2	66,399 0 0	8,965 12 2	6 0	4 8	4,529 13 0	10,500 0 0†	

* The survey of the estate has been completed; only the area cadastrally surveyed has been shown in column 9, and the rest is jungle which has been surveyed, 4 inches to a mile.
† This is the total expected, but not in addition to 4,529 obtained.

M. F.

B.

Statement showing progress of Settlement of Rents made in Kanika Ward's permanently-settled estate up to 30th September 1891.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which rents have been recorded— Up to 30th September 1890.	Number of villages in which rents have been recorded— During period under report.	Total number of raiyats in the villages in column 4.	Number of raiyats whose rents have been recorded. Up to 30th September 1890.	Number of raiyats whose rents have been recorded. During period under report.	Number of raiyats whose rents have been recorded. Total of columns 8 and 9.	Total rental of tenants whose rents have been settled. According to new settlement.	According to previous jama-bandi.	Increase.	Decrease.	Area settled.	Number of raiyats who have not signed the kabuliats in token of acceptance of rents recorded.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
										Rs. A. P.	Rs. A. P.	Rs. A. P.		Acres.		
Orissa ...	Cuttack ...	Kanika ...	632	4	194	32,098	109	7,848	7,957	33,427 11 7	28,897 14 7	4,529 13 0	Nil	30,912	2,434	

KANIKA SETTLEMENT OFFICE;
The 17th November 1891.

S. S. HOSSEIN,
Settlement Officer.

APPENDIX Y.

No. 51, dated Mollarpore, the 26th October 1891.

From—Moonshi Nundjee, Settlement Officer, Mollarpore Estate,
To—The Director of Land Records and Agriculture, Bengal.

With reference to Government order No. 455TR, dated the 24th September 1891, a copy of which was forwarded to me by the Secretary to the Board of Revenue with his memorandum No. 1102A of the 30th idem, I have the honour to submit herewith my progress report on the survey and settlement of the Mollarpore estate, district Birbhum, for the six months ending 30th September 1891. The report was due on the 15th instant; but I regret that some delay unavoidably occurred in compiling the statistical results given in paragraphs 21 to 28.

2. *General description of the tract.*—Pargana Mollarpore, designated on the district tauzi as No. 450, comprises 45 villages, and contains an area of 23,530 acres, or 36·76 square miles. It is a permanently-settled estate, and is owned by Mohunth Gopal Das as a patnidar. It is subdivided into 14 huddas, or blocks, each hudda containing a group of villages for convenience of collection. The western portion of the pargana is overrun with jungle, and is inhabited by Sonthals; the remainder is an extensive and unbroken sheet of rice land, fringed round by villages and foliage. Some of the villages in the eastern portion of the pargana is liable to inundation.

The tract is a purely agricultural one, rice being the chief staple. Aman rice suffices to feed the population and allows of some export. Along the bank of the river Dwarka, which flows for about 3 miles through the pargana, vegetables are raised in great abundance. There is a small production of kodo and makai in the Sonthali villages, and these, with some mulberry and sugarcane cultivation, comprise the whole resources of the pargana.

3. *Soil.*—The soil of a portion of the pargana is affected by its proximity to the iron bed, and contains a great quantity of clay in its composition.

4. *Irrigation.*—The tank area is large, and water plays an important part in the irrigation of the pargana. There are no less than 1,241 tanks, of which 1,025 are used for irrigation purposes; the remaining 216 tanks are reserved for purposes of drinking-water and for the rearing of fish. Out of the 1,025 tanks used for irrigation, 565 are in tolerably good condition, but the remaining 460 stand in need of thorough repair. They are almost silted up, and water dries up in them shortly after the rainy season. Although they have not yet produced a markedly injurious effect on the agricultural operations, there can be no doubt that it will give a great stimulus to agricultural improvement if they are repaired and made available for irrigation purposes. Many tanks are in khas possession of the landlord, Mohunth Gopal Das, who ever since his succession to the estate by purchase, has been too busy in fighting out his quarrel with his tenants to think of making any improvement in his zamindari. Some of the tanks are owned by raiyats, who are not so well off as to be able to bear the cost of their re-excavation.

5. *Grazing ground.*—The area of the grazing ground is not so large as compared with that under plough.

6. *Condition of the people.*—The material condition of the inhabitants of the eastern portion of the pargana is said to have much improved of late years owing to the enhancement of the prices of agricultural products. This is due principally to better means of communication with the great commercial centre of Calcutta since the opening of the East Indian Railway loop line.

7. The Sonthals are, however, poor on account of their habits and customs. They are generally in debt to the mahajan, or village money-lender, who advance money or grain on the security of next crop. Though rents are low and the produce of the land good, the Sonthals are in constant difficulties, chiefly from improvidence. They are, however, very useful in clearing jungle and keeping in cultivation the waste lands which abound in the west of the pargana known as Jungle Mehal.

8. The raiyats of the estate had to fight out their quarrel with their landlord Mohunth, for nearly 18 years, whose men tried to squeeze as much as they could out of the raiyats. Some of the leading raiyats fared ill in the fight, having lost their jotes which the Mohunth caused to be sold in execution of decrees for arrears of rent obtained against them.

9. *Fiscal history*—Mollarpore derives its name from Mollar Sing, who was its original proprietor, a religious and popular man. It is said that he was imposed upon by a person

who told him that the Rajah of Nagore intended to make him adopt the religion of Mahomed. He took it so much to heart that without enquiry as to its truth he put himself to death. On his death the pergunnah fell into the hands of the Rajah of Malooti, whose successor sold it to the Maharajah of Burdwan, who is its present proprietor.

10. The Maharajah let out the pergunnah (exclusive of a portion known as Jungle Mahál) in putni taluk to Umasundari Dassya and Khetra Kumari Bibi at a yearly rental of Rs. 25,600. But the latter gave a darputni lease of her 8 annas share in the taluk to Umasundari Dassya, who agreed to pay her Rs. 1,000 as profit, besides the rental payable by her to the Maharaja for her 8 annas share. Thus Umasundari Dassya became the sole malik of the taluk, which she held for 26 years, 1252 to 1278 (1846 to 1872 A.D.).

11. In 1278 Umasundari Dassya sold her putni and darputni right to Mohunth Gopal Das, who is the present talukdar.

12. The western portion of the pargana known as Jungle Mahál did not form part of the putni and darputni lease of Umasundari Dassya. The Jungle Mahál was then held as a separate putni taluk by one Kedar Nath Mitra, whose interest in it was sold in execution of a decree against him and purchased by Mohunth Gopal Das for Rs. 7,000, the rent payable to the Maharaja being Rs. 3,232.

13. It will be thus seen that Mohunth Gopal Das holds the whole estate, which is identical with pargana Mollarpore, under the Maharaja of Burdwan, at a total rental of Rs. 28,832 per annum.

14. The present mofussil collection of the Mohunth from the whole estate, including Jungle Mahál is Rs. 41,196. Deducting from this amount Rs. 28,832 payable by the Mohunth to the Maharajah of Burdwan and Rs. 1,000 to Khetra Kumari Bibi, it leaves to the Mohunth a profit of Rs. 12,364 according to his own papers. But the amount of existing rent ascertained under rule 25, chapter VI of the Government rules under the Bengal Tenancy Act is Rs. 37,632-6-16¼ gundahs, which is less than the amount shown in the Mohunth's rent-roll by Rs. 3,563-9-3¾. The difference is due to the fact that the Mohunth's rent-roll shows collections on account of hât, saer, nij-jote, &c., which do not appear in our khatian. Besides, nearly a sum of Rs. 1,000 was excluded from the existing rent as it appeared to be doubtful and disputed. The Mohunth's agent is trying to establish his claim to this amount in the cases for the settlement of rent. The Government revenue of the estate is Rs. 17,741-9.

15. *Origin of dispute between the landlord and tenants.*—When Umasundari Dassya wanted to dispose of her talukdari right, she could not obtain a good price, as her profit (about Rs. 2,871) was so small that nobody cared to purchase it. She therefore caused a set of papers to be prepared raising the raiyats' rent at the rate of 2 annas, and in some cases 4 annas, per rupee. The Mohunth without sufficient enquiry as to the correctness of the papers, purchased the estate at Rs. 74,000 and called upon the tenants to pay him rents accordingly. But, as might be expected, the raiyats refused to pay anything over and above the rent actually paid by them; and hence the split. The Mohunth has been at feud with his tenants for the last 18 years, each party spending much good money on bad advice. Things went on from bad to worse, and several breaches of the peace occurred. To remedy the evil the local authorities recommended for a survey and settlement of the estate under section 101 (2) (*b*) of the Bengal Tenancy Act.

16. *Government Notification sanctioning the survey.*—The Government was pleased to sanction the survey and record of rights of the estate by its notification dated the 5th November 1889, and I was placed in charge of the work.

17. *Commencement of the operation.*—The preliminaries having been settled in December 1889, the survey commenced in January 1890 under my supervision, in addition to my duties as settlement officer of the Dubalhati estates in the district of Rajshahi.

18. *Progress of the survey and settlement.*—The survey and khanapuri having been finished in October 1890, the work of bujharat or local explanation of entries in the khasra and khatians to the parties concerned, and the office duties, such as comparison and passing of boundaries, computation and passing of field areas, checking the total area of villages by summation of field, &c., were mostly done during the last cold weather.

19. *Difficulty in carrying on the survey and attitude of the people.*—But the inexperience and incompetency of the field establishment to cope with the work without close supervision, and the difficulties experienced in securing the attendance of the tenants before the amíns to point out their lands, not a little arrested the progress of the survey. Of the amíns who had worked under me in Dubalhati, some had been transferred to Dumka and Dinajpore, and others had been discharged before I received orders to commence the survey of Mollarpore, and so new men had to be trained and employed in survey work.

20. The attitude of the landlord and tenants was not on the whole favourable to the survey in the beginning. It must be remembered that the survey in a manner had been forced upon them. Neither the landlord nor the tenants applied for them. The landlord viewed the work with distrust, as likely to lessen his influence over the tenants. The raiyats at first regarded the survey with apathy, as they laboured under the impression that the survey was made at the instance of the Mohunth to resume their rent-free lands and enhance their rent. They were, however, disabused of their wrong impression as the survey progressed. They now take pains to see that entries in the khatians regarding their lands and rents have been correctly made.

21. *Classification of holding.*—The attestation work of the Mollarpore estate was finished during the period under report, and a record of rights of all tenants, including

under-raiyats, was prepared. The subjoined statement gives details of the different classes of tenants in the estate:—

Class of cultivation.	Number of holdings.	Area of holding.	Average area per holding.	Rent.	Average rent per acre.	Remarks.
		Acres.	Acres.	Rs. A. G.	Rs. A. G.	
1. Tenure-holders ...	30	3,485	116	3,627 9 2½	1 0 13	
Raiyats holding under proprietors.						
2. Raiyats at fixed rates ...	45	226	5	322 5 17½	1 6 17	
3. Settled raiyats ...	2,316	8,894	4	30,314 7 17	3 6 10¾	
4. Occupancy ...	100	394	4	1,235 9 5¾	3 2 3¼	
5. Non-occupancy ...	299	593	2	2,132 6 13½	3 9 10¾	
Total ...	2,790	13,592	4·8	37,632 6 16½	2 12 6	
Raiyats holding under tenure-holders.						
6. Settled raiyats ...	215	1,025	5	1,726 9 0	1 10 19	
7. Non-occupancy ...	31	68	2	257 13 0	3 12 6½	
Total ...	246	1,093	4·4	1,984 6 0	1 13 0¾	
8. Under-raiyats ...	961	485	·5	2,068 15 12½	4 4 4¼	

22. *Area held by proprietor.*—The area of land entered in the name of the proprietor, is 6,228 acres, or 26·4 per cent. of the whole area. But this is not his private land within the meaning of chapter X of the Bengal Tenancy Act.

23. *Rent-free area.*—The area of rent-free land in the estate, such as brahmotter, peerpal, debotter, chakran, &c., is 2,343 acres, or 9·9 per cent. of the whole area.

24. *Rent-paying area.*—The rent-paying area is 13,592 acres, or 57·7 per cent. of the whole area.

25. According to present survey the area of cultivated land is 13,790 acres, or 58·6 per cent. of the whole area is cultivated and 41·4 per cent. is uncultivated.

26. *Cropped area.*—The area under cultivation of the different harvests is as under :—

	Acres.
Bhadoi	667
Aghani	12,286
Rabi	510
Double-cropped area ...	327
Total ...	13,790

27. *Average area of raiyati holding.*—The average area of a raiyati holding is 14 bighas or 4·6 acres.

28. *Average size of field.*—The average area of the field is found to be 2 bighas, or ·66 acre.

29. *Cost of survey and settlement.*—The actual cost of survey and settlement from the commencement to 30th September 1891 amounts to Rs. 12,988-9-3, of which Rs. 7,125 are for survey and Rs. 5,863-9-3 are for settlement.

30. *Explanation of expenditure likely to be incurred in excess of the estimate.*—The actual charges of the survey have been annas 4-10 per acre. But the cost of settlement is likely to be higher than would appear to be desirable. This is due to a variety of causes, the chief among which are mentioned below :—

In the first place, the Mohunth's men caused a large area of land of the neighbouring estates to be demarcated as belonging to Mollarpore estate, which gave rise to several boundary disputes, which had to be disposed of after local enquiry into each case. As it was proved that the Mohunth had been out of possession of the land for a long time, his claim was disallowed, though the cost incidental to their demarcation and survey and to their exclusion after local enquiry had been incurred. In one of these cases it was necessary to fine the zamindar of a neighbouring estate Rs. 60 for having destroyed boundary marks in order to deter others from following his example, and my order was confirmed on appeal by the Special Judge.

The total number of boundary disputes reported was 31, which have all been disposed of. Of these 5 were disposed of before and 26 during the period under report.

In the second place, in several villages detached lands of other estates are situated. These lands were demarcated at the instance of the Mohunth and his friendly tenants as belonging to the Mollarpore estate. But the proprietors of these estates are now contesting the Mohunth's claim, and the detached lands are being excluded from the operations, the Mohunth's claim to them being found utterly without foundation.

In the third place, the attempt made by the Mohunth to resume rent-free lands has given rise to numerous disputes relating to occupancy of land and rent free-tenures. The real struggle between the Mohunth and his tenants is not so much for enhancement as for resumption of rent-free lands. The Mohunth's men would not admit the existence of any rent-free lands in the estate. They have objected to every plot of land claimed by the tenants as rent-free. I have rejected the Mohunth's objection in almost all cases, as the tenants' lakhraj title is supported by long, uninterrupted possession, and in several cases by good documentary evidence.

31. *Disputes relating to occupancy of land and rent-free tenures.*—The total number of disputes relating to occupancy of land and rent-free tenures disposed of up to 30th September last was 818, leaving 28 pending on the 1st instant, and of these 818 disputes, 352 were disposed of before and 466 during the half-year under report.

32. *Application for settlement of rent.*—The total number of applications for the settlement of fair rent was 133, of which 43 were disposed of, leaving 90 pending at the close of the period under report.

33. *Explanation of delay in the settlement of rent.*—The disputes relating to rent-free lands stood in the way of settlement of fair rent. It would be worse than useless to settle fair rent without disposing of claim to rent-free lands, as the lands which the raiyats claimed to hold rent-free were alleged by the landlords to be rent-paying. It may be said that fair rent of a village should have been settled as soon as claims to rent-free lands were disposed of in it. But this could not be done in Mollarpore, where raiyats make lump payments, though the lands comprised in their respective holdings lie scattered in two or more villages in the hudda. I have in numerous instances found that the raiyats cultivating land in one village have got their rents entered in another in the zamindari papers. This matter did not escape the notice of the Director when he inspected the office on the 9th February last. In paragraph 9 of his memorandum of inspection the Director observed:—

"The result of the present measurement cannot at present be compared with areas shown in the Mohunth's papers generally, because these papers do not show the area of each raiyat's holding in each village, but the total area held by the raiyat in all the villages of the estate."

34. It was therefore considered advisable to prepare jamabandi of the estate after settlement of disputes relating to occupancy of land and rent-free tenures. Now that the majority of such disputes have been decided, cases for settlement of rent have been taken up and are being disposed of with all possible speed.

35. *Proposal for amicable settlement of fair rent.*—As I have pointed out in previous reports, the settlement of Mollarpore requires delicate handling. The relation between the landlord and tenants is strained in the highest degree, and we have to proceed with caution and to employ much persuasion for reducing the bitterness of feeling and for effecting amicable settlement as far as possible. The cases were at first postponed at the instance of the Mohunth and his tenants, to enable them to see if they could come to an amicable arrangement, as suggested by the Director in his memorandum of inspection referred to. They did not, however, come to terms, though sufficient time was allowed to them as applied for by them. The tenants said that they could not accept the terms of compromise without an assurance from the Mohunth that he would not contest their claims to rent-free lands. The Mohunth's agent alleged that as the tenants had exaggerated their claims to rent-free lands, he could not find himself in a position to admit them all. I therefore set about settling claims to rent-free lands in view of paving way to amicable settlement of fair rent. As soon as a number of these cases was disposed of, raiyats began putting in petitions accepting the terms of compromise. I was arbitrating and trying to arrive at terms which both parties would consent to. It was a case of compromise, of conciliation, of give and take. But it now appears that the Collector disapproves of the terms of compromise on the ground that they are likely to enhance the existing rent of the raiyats, and that in his opinion the Mohunth is not deserving of such enhancement. But I respectfully beg to point out that *additional* rent for *additional* land is no enhancement in the eye of law. I have pointed out in my previous reports that there are no grounds for enhancement of rent under section 30 of the Bengal Tenancy Act. It appeared to me, however, that grounds for alteration of rent under section 52 (*a*) existed in a large number of instances. It is true that in many cases the Mohunth enhanced the raiyats' rent by arbitrary exercise of proprietary power and by abuse of the rights of contract, which led to the formation of agrarian league against him. But it would, I respectfully submit, be absurd to suppose that in settling fair rent of holdings, cases of encroachment by raiyats upon the uncultivated and unoccupied land of their landlord would not come to light. Of course, in a more advanced and more settled part of the country, where there is little or no waste, where the fields are tolerably well demarcated by ails, and every field has a well-known owner, it would be difficult to get good and sufficient evidence of the existence of *excess* land in the occupation of raiyats. But such evidence would be forthcoming in several villages of the Mollarpore estate, where a considerable area of land lies fallow or waste, the opportunity and temptation to encroachment are greater, and the *bonâ fide* cases of encroachment

are consequently numerous. That a considerable area of land has been brought into cultivation even within six months after the present survey may be seen on the spot. And it is for the assessment of such excess land that the terms of compromise were suggested. The duty of a Settlement Officer will no doubt end with settling rent according to law. But it will not only fail to restore good feeling between the landlord and tenant, but will involve them in a heavier cost of litigation. Certainly the cost of survey and settlement is only a fraction of the total cost to the parties in the shape of fees to mookhtars, pleaders, court-fees, process-fees, payment to witnesses, expenses of appeal, &c. But an amicable settlement of disputes, which is a pledge of good faith between the contending parties, enables them to avoid the cost of litigation and creates mutual confidence and mutual reliance on one another which bind them together in a common bond of sympathy and fellow feeling.

36. The terms of compromise proposed give the Settlement Officer entire liberty of action to fix in every individual case what he considers to be a fair rent. and section 35 of the Bengal Tenancy Act empowers him to refuse enhancements, wherever existing rents are excessive. Of course amicable settlement of disputes cannot be made an excuse for prolonging the operations, and so the cases are being decided according to law.

37. *Work expected to be completed.*—I hope to be able to finish the case work by end of January next, when my services may be available for settlement of Ruksole and other villages belonging to the Hurdia Factory in Champaran. But it may be necessary, to retain a portion of the establishment up to the end of March next to arrange records to distribute khatians, &c., and the next half-yearly progress report will be my final completion report.

38. *Total cost per acre.*—The total cost of survey and settlement from the commencement of the operations to its completion is estimated at Rs. 16,180-2-6, or annas 10-10 per acre, exclusive of Rs. 1,130-9-6 on account of the price of office furniture, printed forms, &c., which need not be included in the survey expenses. They will be disposed of after the completion of the work and the proceeds credited to the estate.

39. *Court-fees, process-fees, &c.*—A sum of Rs. 1,680 has already been realised on account of process-fees, court-fees, and copying fees, and a further sum of Rs. 1,500 is expected to be realised on these accounts before the completion of the work, making a total of Rs. 3,180, which must be deducted from the total cost of the proceeding to be recovered under section 114 of the Act. Deducting Rs 3,180 from the total cost of Rs. 16,180-2-6 the cost per acre is reduced to annas 8-9, that is to say, 9 pies in excess of the rate required by Rule 46, Chapter VI of the Government Rules under the Bengal Tenancy Act; and this, I trust, will be considered satisfatory.

40. *Conclusion.*—In conclusion, I beg to add that during the period under report a portion lof my time was occupied in preparing my final completion report on the survey and settement of the Dubalhati estate. I also went to Champaran in September last and tested the survey of a village belonging to the Hurdia Factory, as will appear from my memorandum of inspection, a copy of which was forwarded to you with my memorandum No. $\frac{CH}{2}$, dated the 23rd September 1891.

41. Appended to this are Statements A and B.

A.

Statement showing the estate under Survey and Settlement during the half-year ending 30th September 1891.

Division.	District.	Number of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed.			Number of villages of which the records have been handed over by the survey to the Settlement Officer—		Total cost.						Rate per acre.		Increase on rent—		Remarks.
						Up to 31st March 1891.	During the half-year under report.	Total area surveyed.	Up to 31st March 1891.	During the half-year under report.	Up to 31st March 1891.		During the half-year under report.		Total.		Survey.	Settlement.	Actually obtained.	Expected.	
											Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Burdwan ...	Birbhum ...	1 (Mollarpore).	45	23,321	Non-professional	23,530	...	23,530	44	1	Rs. 7,125	Rs. A. P. 2,190 9 8	Rs. ...	Rs. 3,673	Rs. 7,125	Rs. A. P. 5,863 9 3	Rs. A. P. 0 4 10	Rs. A. P. 0 3 11	Rs. 277	Rs. 2,723	

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B.

Statement showing progress made in Mollarpore private estate in record of rights and settlement of rents up to 30th September 1891.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which record of rights has been completed—		Total number of raiyats in the villages in column 4.	Number of raiyats whose rent had been recorded and status determined.			Total rental of tenants whose rents have been settled.				Remarks.
				Up to 31st March 1891.	During the half-year under report.		Up to 31st March 1891.	During the half-year under report.	Total of columns 8 and 9.	According to new settlement.	According to previous jamabandi.	Increase.	Decrease.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Burdwan ...	Birbhum ...	Mollarpore...	45	41	4	3,997	3,006	991	3,997	Rs. A. P. 2,003 0 0	Rs. A. P. 1,726 0 0	Rs. A. P. 277 0 0	...	

NUNDJEE,

The 26th October 1891. *Settlement Officer.*

APPENDIX Z.

No. 58, dated Mollarpore, the 5th November 1891.

From—Moonshi Nundjee, Settlement Officer, Mollarpore Estate,
To—The Director of Land Records and Agriculture, Bengal.

In continuation of my No, 52, dated the 27th ultimo, I have the honour to submit a separate annual report covering the period from the 1st October 1890 to 30th September 1891, as called for in your telegram of the 4th instant which has been just received.

2. *General description of the tract.*—Pargana Mollarpore, designated on the district tauzi as No. 450, comprises 45 villages and contains an area of 23.530 acres, or 36·76 square miles. It is a permanently-settled estate, and is owned by Mohanth Gopal Das as a patnidar. It is subdivided into 14 huddas or blocks, each hudda containing a group of villages for convenience of collection. The western portion of the pargana is overrun with jungle and is inhabited by Sonthals, the remainder is an extensive and unbroken sheet of rice land fringed round by villages and foliage. Some of the villages in the eastern portion of the pargana is liable to inundation.

The tract is a purely agricultural one, rice being the chief staple. Amun rice suffices to feed the population and allows of some export. Along the bank of the river Dwarka, which flows for about 3 miles through the pargana, vegetables are raised in great abundance. There is a small production of kodo and makai in the Sonthali villages, and these with some mulberry and sugarcane cultivation comprise the whole resources of the pargana.

3. *Soil.*—The soil of a portion of the pargana is affected by its proximity to the iron bed, and contains a great quantity of clay in its composition.

4. *Irrigation.*—The tank area is large, and water plays an important part in the irrigation of the pargana. There are no less than 1,241 tanks, of which 1,025 are used for irrigation purposes; the remaining 216 tanks are reserved for purposes of drinking water and for the rearing of fish. Out of the 1,025 tanks used for irrigation, 565 are in tolerably good condition, but the remaining 460 stand in need of thorough repair. They are almost silted up, and water dries up in them shortly after the rainy season. Although they have not yet produced a markedly injurious effect on the agricultural operations, there can be no doubt that it will give a great stimulus to agricultural improvement if they are repaired and made available for irrigation purposes. Many tanks are in khas possession of the landlord, Mohanth Gopal Das, who ever since his succession to the estate by purchase has been too busy in fighting out his quarrel with his tenants to think of making any improvement in his zamindari. Some of the tanks are owned by raiyats, who are not so well off as to be able to bear the cost of their re-excavation. No facility for irrigation exists in Sonthali villages, and the crop is entirely dependent upon rainfall.

5. *Grazing ground.*—The area of the grazing ground is not so large as compared with that under plough.

6. *Condition of the people.*—The material condition of the inhabitants of the eastern portion of the pargana is said to have much improved of late years, owing to the enhancement of the prices of agricultural products. This is due principally to better means of communication with the great commercial centre of Calcutta since the opening of the East Indian Railway loop line.

7. The Sonthals are, however, poor on account of their habits and customs. They are generally in debt to the mahajan, or village money-lenders, who advance money or grain on the security of next crop. Though rents are low and the produce of the land good, the Sonthals are in constant difficulties chiefly from improvidence. They are, however, very useful in clearing jungle and keeping in cultivation the waste lands which abound in the west of the pargana known as Jungle Mahal.

8. The raiyats of the estate had to fight out their quarrel with their landlord, Mohanth, for nearly 18 years, whose men tried to squeeze as much as they could out of the raiyats. Some of the leading raiyats fared ill in the fight, having lost their jotes, which the Mohanth caused to be sold in execution of decrees for arrears of rent obtained against them.

9. *Fiscal history.*—Mollarpore derives its name from Mollar Singh, who was its original proprietor, a religious and popular man. It is said that he was imposed upon by a person, who told him that the Rajah of Nagore intended to make him adopt the religion of Mahomed. He took it so much to heart that without enquiry as to its truth he put himself to death. On his death the pargana fell into the hands of Rajah of Malooti, whose successors sold it to the Maharaja of Burdwan, who is its present proprietor.

10. The Maharaja let out the pergunnah (exclusive of a portion known as Jungle Mahal) in patni taluk to Umasundari Dasi and Khetra Kumari Bibi at a yearly rental of

Rs. 25,600. But the latter gave a darpatni lease of her 8-anna share in the taluk to Umasundari Dasi, who agreed to pay her Rs. 1,000 as profit, besides the rental payable by her to the Maharaja for her 8-anna share. Thus Umasundari Dasi became the sole malik of the taluk, which she held for 26 years, 1252 to 1278 (1846 to 1872 A.D.).

11. In 1278 Umasundari Dasi sold her putni and darpatni right to Mohanth Gopal Das, who is the present talukdar.

12. The western portion of the pargana known as Jungle Mahal did not form part of the patni and darpatni lease of Umasundari Dasi. The Jungle Mahal was then held as a separate patni taluk by one Kedar Nath Mitter, whose interest in it was sold in execution of a decree against him and purchased by Mohanth Gopal Das for Rs. 7,000, the rent payable to the Maharaja being Rs. 3,232.

13. It will be thus seen that Mohanth Gopal Das holds the whole estate, which is identical with pargana Mollarpore, under the Maharaja of Burdwan at a total rental of Rs. 28,832 per annum.

14. The present mofussil collection of the Mohanth from the whole estate, including Jungle Mahal, is Rs. 41,196. Deducting from the amount Rs. 28,832 payable by the Mohanth to the Maharaja of Burdwan and Rs. 1,000 to Khetra Kumari Bibi, it leaves to the Mohanth a profit of Rs. 12,364 according to his own papers. The amount of existing rent ascertained under Rule 25, Chapter VI of the Government rules under the Bengal Tenancy Act is Rs. 37,632-6-16¼, which is less than the amount shewn in the Mohanth's rent-roll by Rs. 3,563-9-3¾. The difference is due to the fact that the Mohanth's rent-roll shows collection on account of hât, sair, nij-jote, &c., which do not appear in our khatians.

Besides, nearly a sum of Rs. 1,000 was excluded from the existing rent, as it appeared to be doubtful and disputed. The Mohanth's agent is trying to establish his claim to this amount in the cases for the settlement of rent.

The Government revenue of the estate is Rs. 17,741-9-0.

15. *Origin of dispute between landlord and tenants.*—When Umasundari Dasi wanted to dispose of her talukdari right, she could not obtain a good price, as her profit (about Rs. 2,871) was so small that nobody cared to purchase it. She therefore caused a set of papers to be prepared raising the raiyats' rent at the rate of 2 annas, and in some cases 4 annas per rupee. The Mohanth, without sufficient enquiry as to the correctness of the papers, purchased the estate at Rs. 74,000, and called upon the tenants to pay him rent accordingly. But, as might be expected, the raiyats refused to pay anything over and above the rent actually paid by them; and hence the split. The Mohanth has been at feud with his tenants for the last 18 years, each party spending much good money on bad advice. Things went on from bad to worse, and several breaches of the peace occurred. To remedy the evil, the local authorities recommended for a survey and settlement of the estate under section 101 (2) (*b*) of the Bengal Tenancy Act.

16. *Government notification sanctioning the survey.*—The Government was pleased to sanction the survey and record of rights of the estate by a notification dated the 5th November 1889, and I was placed in charge of the work.

17. *Commencement of the operation.*—The preliminaries having been settled in December 1889, the survey commenced in January 1890 under my supervision, in addition to my duties as Settlement Officer of the Dubulhati estates in the district of Rajshahi.

18. *Progress of the survey and settlement.*—The survey and khanapuri having been finished in October 1890, the work of bujharat or local explanation of entries in the khusra and khatian to the parties concerned, and the office duties, such as comparison and passing of boundaries, computation and passing of field areas, of checking the total area of villages by summation of field, &c., were mostly done during the first half of the year (1st October 1890 to 31st March 1891) under report.

19. *Difficulty in carrying on the survey, and attitude of the people.*—But the inexperience and incompetency of the field establishment to cope with the work without close supervision, and the difficulties experienced in securing the attendance of the tenants before the amins to point out their lands, not a little arrested the progress of the survey. Of the amins who had worked under me in Dubulhati, some had been transferred to Dumka and Dinajpur, and others had been discharged before I received orders to commence the survey of Mollarpore, and so new men had to be trained and employed in survey work.

20. The attitude of the landlord and tenants was not on the whole favourable to the survey in the beginning. It must be remembered that the survey in a manner had been forced upon them. Neither the landlord nor the tenants applied for it. The landlord viewed the work with distrust as likely to lessen his influence over the tenants. The raiyats at first regarded the survey with apathy, as they laboured under the impression that the survey was made at the instance of the Mohanth to resume their rent-free lands and enhance their rent. They were, however, disabused of the wrong impression as the survey progressed. They now take pains to see that entries in the khatians regarding their lands and rents have been correctly made.

21. *Attestation and classification of holdings.*—The khatians of 41 out of 45 villages were attested during the first half of the year ending 31st March 1891, and those of the remaining 4 villages during the second half-year ending 30th September 1891.

Out of the 3,997 tenants in the estate, rent and status of 3,006 were recorded during the first half, and those of the remaining 991 during the second half of the year under

report. The subjoined statement gives details of the different classes of tenants in the estate :—

Class of cultivation.	Number of holdings.	Area of holdings in acres.	Average area per holding.	Rent.	Average rent per acre.	Remarks.
				Rs. A. G.	Rs. A. G.	
1. Tenure-holders ...	30	3,485	116	3,627 9 2½	1 0 13	
Raiyats holding under proprietors.						
2. Raiyats at fixed rates ...	45	226	5	322 5 17½	1 6 17	
3. Settled raiyats ...	2,316	8,894	4	30,314 7 17	3 6 10¾	
4. Occupancy	100	394	4	1,235 9 5¾	3 2 3¼	
5. Non-occupancy ...	299	593	2	2,132 6 13½	3 9 10¾	
Total ...	2,790	13,592	4·8	37,632 6 16½	2 12 6	
Raiyats holding under tenure-holders,						
6. Settled raiyats ...	215	1,025	5	1,726 9 0	1 10 19	
7. Non-occupancy ...	31	68	2	257 13 0	3 12 6½	
Total ...	246	1,093	4·4	1,984 6 0	1 13 0¾	
8. Under-raiyats... ...	961	485	·5	2,068 15 12½	4 4 4½	

22. *Area held by proprietor.*—The area of land entered in the name of the proprietor is 6,228 acres, or 26·4 per cent. of the whole area. But this is not his private land within the meaning of Chapter X of the Bengal Tenancy Act.

23. *Rent-free area.*—The area of rent-free land in the estate, such as brahmutter, perpal, debutter, chakeran, &c., is 2,343 acres, or 9·9 per cent. of the whole area.

24. *Rent-paying area.*—The rent-paying area is 13,592 acres, or 57·7 per cent. of the whole area.

25. According to present survey the area of cultivated land is 13,790 acres, or 58·6 per cent. of the whole area is cultivated, and 41·4 per cent. is uncultivated.

26. *Cropped area.*—The area under cultivation of the different harvests is as under :—

	Acres.
Bhadoi	667
Aghani	12,286
Rabi	510
Double-cropped area	327
	13,790

27. *Average area of raiyati holding.*—The average area of a raiyati holding is 14 bighas, or 4·6 acres.

28. *Average size of field.*—The average area of the field is found to be 2 bighas, or ·66 acres.

29. *Cost of survey and settlement.*—The actual cost of survey and settlement from the commencement to 30th September 1891 amounts to Rs. 12,988-9-3, of which Rs. 7,125 are for survey and Rs. 5,863-9-3 are for settlement. The total cost during the year under report amounts to Rs. 6,521-11-4, of which Rs. 658-2-1 are for survey and Rs. 5,863-9-3 for settlement, as detailed in statement A.

30. The actual charges of the survey have been 4 annas and 10 pies per acre. But the cost of settlement is likely to be higher than would appear to be desirable. This is due to a variety of causes, the chief among which are mentioned below :—

In the first place, the Mohanth's men caused a large area of land of the neighbouring estates to be demarcated as belonging to Mollarpore estate, which gave rise to several boundary disputes, which had to be disposed of after local enquiry into each case. As it was proved that the Mohanth had been out of possession of the land for a long time, his claim was disallowed, though the cost incidental to their demarcation and survey and to their exclusion after local enquiry had been incurred. In one of these cases it was necessary to fine the zemindar of a neighbouring estate Rs. 60 for having destroyed boundary marks in order to deter others from following his example, and my order was confirmed on appeal by the Special Judge.

The total number of boundary disputes reported during the year was 31, which have all been disposed of. Of these, 5 were disposed of during the first half, and the remaining 26 during the second half of the year under report.

In the second place, in several villages detached lands of other estates are situated. These lands were demarcated at the instance of the Mohanth and his friendly tenants as belonging to the Mollarpore estate. But the proprietors of these estates are now contesting the Mohanth's claim. The lands are not situated in separate compact blocks marked off by defined boundaries, but are all interlaced with raiyati land of the Mollarpore estate, and much time is taken up in excluding them after local enquiry into each plot. In the third place the attempt made by the Mohanth to resume rent-free lands has given rise to numerous disputes relating to occupancy of land and rent-free tenures. The real struggle between the Mohanth and his tenants is not so much for enhancement as for resumption of rent-free lands. The Mohanth's men would not admit the existence of any rent-free lands in the estate. They have objected to every plot of land claimed by the tenants as rent-free. I have rejected the Mohanth's objection in almost all cases, as the tenants' lákhiraj title is supported by long uninterrupted possession, and in several cases by good documentary evidence.

31. *Disputes relating to occupancy of land and rent-free tenures.*—The total number of disputes relating to occupancy of land and rent-free tenures disposed of during the year was 818, leaving 28 pending on the 1st October 1891. Of these 818 disputes, 352 were disposed of from 1st October 1890 to 31st March 1891, and 466 from 1st April to 30th September 1891.

32. *Application for settlement of rent.*—The total number of applications for the settlement of fair rent received during the year was 133, of which 43 were disposed of, leaving 90 pending at the close of the year.

33. *Explanation of delay in the settlement of rent.*—The disputes relating to rent-free lands stood in the way of settlement of fair rent. It would be worse than useless to settle fair rent without disposing of claim to rent-free lands, as the lands which the raiyats claimed to hold rent-free were alleged by the landlord to be rent-paying. It may be said that fair rent of a village should have been settled as soon as claims to rent-free lands were disposed of in it. But this could not be done in Mollarpore, where raiyats make lump payment, though the lands comprised in their respective holdings lie scattered in two or more villages in the hudda.

I have in numerous instances found that the raiyats cultivating land in one village have got their rents entered in another in the zamindari papers. This matter did not escape the notice of the Director when he inspected the office on the 9th February last. In paragraph 9 of his memorandum of inspection the Director observed:—

"The result of the present measurement cannot at present be compared with areas shown in the Mohanth's papers generally, because these papers do not show the area of each raiyat's holding in each village, but the total area held by the raiyat in all the villages of the estate."

34. It was therefore considered advisable to prepare jummabundi of the estate after settlement of disputes relating to occupancy of land and rent-free tenures. Now that the majority of such disputes have been decided, cases for settlement of rent have been taken up and are being disposed of with all possible speed.

35. *Proposal for amicable settlement of fair rent.*—As I have pointed out in previous reports, the settlement of Mollapore requires delicate handling. The relation between the landlord and tenants is strained in the highest degree, and we have to proceed with caution, and to employ much persuasion for reducing the bitterness of feeling and for effecting amicable settlement as far as possible. The cases were at first postponed at the instance of the Mohanth and his tenants to enable them to see if they could come to an amicable arrangement, as suggested by the Director in his memorandum of inspection referred to. They did not, however, come to terms, though sufficient time was allowed to them as applied for by them. The tenants said that they could not accept the terms of compromise without an assurance from the Mohanth that he would not contest their claims to rent-free lands. The Mohanth's agent alleged that as the tenants had exaggerated their claims to rent-free lands, he could not find himself in a position to admit them all. I therefore set about settling claims to rent-free lands in view of paving way to amicable settlement of fair rent. As soon as a number of these cases was disposed of, raiyats began putting in petitions accepting the terms of compromise. I was arbitrating and trying to arrive at terms which both parties would consent to. It was a case of compromise, of conciliation, of give-and-take. But it now appears that the Collector disapproves of the terms of compromise, on the ground that they are likely to enhance the existing rent of the raiyats, and that in his opinion the Mohanth is not deserving of such enchancement. But I respectfully beg to point out that *additional* rent for *additional* land is no enhancement in the eye of law. I have pointed out in my previous reports that there are no grounds for enhancement of rent under section 30 of the Bengal Tenancy Act. It appeared to me, however, that grounds for alteration of rent under section 52 (*a*) existed in a large number of instances. It is true that in many cases the Mohanth enhanced the raiyat's rent by arbitary exercise of proprietary power and by abuse of the rights of contract which led to the formation of agrarian league against him. But it would, I respectfully submit, be absurd to suppose that in settling fair rent of holdings cases of encroachment by raiyats upon the uncultivated and unoccupied land of their landlord would not come to light. Of course in a more advanced and more settled part of the country where there is little or no waste, where the fields are tolerably well demarcated by ails, and every field has a well-known owner, it would be difficult to get good and sufficient evidence of the existence of *excess* land in the occupation of raiyats. But such evidence would be forthcoming in several

villages of the Mollarpore estate, where a considerable area of land lies fallow or waste, the opportunity and temptation to encroachment are greater, and the *bonâ fide* cases of encroachment are consequently numerous. That a considerable area of land has been brought into cultivation even within six months after the present survey may be seen on the spot. And it is for the assessment of such excess land that the terms of compromise was suggested. The duty of a settlement officer will no doubt end with settling rent according to law. But it will not only fail to restore good feeling between the landlord and tenant, but will involve them in a heavier cost of litigation. Certainly the cost of survey and settlement is only a fraction of the total cost to the parties in the shape of fees to mookhtears, pleaders, court-fees, process fees, payment to witnesses, expenses of appeal, &c. But an amicable settlement of disputes, which is a pledge of good faith between the contending parties, enables them to avoid the cost of litigation, and creates mutual confidence and mutual reliance on one another, which bind them together in a common bond of sympathy and fellow feeling.

36. The terms of compromise proposed give the settlement officer entire liberty of action to fix in every individual case what he considers to be a fair rent, and section 35 of the Bengal Tenancy Act empowers him to refuse enhancements wherever existing rents are excessive. Of course amicable settlement of disputes cannot be made an excuse for prolonging the operations, and so the cases are being decided according to law.

37. *Work expected to be completed.*—I hope to be able to finish the case work by end of January next, when my services may be available for settlement of Ruksole and other villages belonging to the Hurdia factory in Champaran. But it may be necessary to retain a portion of the establishment up to the end of March next to arrange records, distribute khatians, &c., and the next half-yearly progress report will be my final completion report.

38. *Total cost per acre.*—The total cost of survey and settlement from the commencement of the operations to its completion is estimated at Rs. 16,180-2-6, or annas 10-10 per acre, exclusive of Rs. 1,130-9-6 on account of the price of office furniture, printed forms, &c., which need not be included in the survey expenses. They will be disposed of after the completion of the work, and the proceeds credited to the estate.

39. *Court fees, process fees, &c.*—A sum of Rs. 1,680 has already been realised on account of process fee, court fee, and copying fees, and a further sum of Rs. 1,500 is expected to be realised on these accounts before the completion of the work, making a total of Rs. 3,180, which must be deducted from the total cost of the proceeding to be recovered under section 114 of the Act. Deducting Rs. 3,180 from the total cost of Rs. 16,180-2-6, the cost per acre is reduced to annas 8-9, that is to say, 9 pies in excess of the rate required by rule 46, of Chapter VI of the Government rules under the Bengal Tenancy Act; and this I trust will be considered satisfactory.

40. *Conclusion.*—In conclusion, I beg to add that during the period under report a portion of my time was occupied in winding up the work, and in preparing my final completion report of the survey and settlement of the Dubulhati estates. I also went to Champaran in September last, and tested the survey of a village belonging to the Hurdia factory, as will appear from my memorandum of inspection, a copy of which was forwarded to you with my memorandum No. CH—2, dated the 23rd September 1891.

Appended to this are statements A and B.

A.

Statement showing the estate under survey and settlement during the year covering the period from 1st *October* 1890 *to* 30th *September* 1891.

Division.	District.	Number of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed in acres.			Number of villages of which the records have been handed over by the Survey Department to the Settlement Officer—		Total cost.						Rate per acre.		Increase of rent—		Remarks.
											Up to 30th September 1890.		During the year under report (from 1st October 1890 to 30th September 1891).		Total.						
						Up to 30th September 1890.	During the year under report (from 1st October 1890 to 30th September 1891).	Total.	Up to 30th September 1890.	During the year under report (from 1st October 1890 to 30th September 1891).	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Survey.	Settlement.	Actually obtained.	Expected.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
											Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
Burdwaan	Beerbhoom...	1 (Mollarpore) ...	45	23,321	Non-professional...	21,711	1,819	23,530	...	45	6,466 13 11	...	658 2 1	5,863 9 3	7,125 0 0	5,863 9 3	0 4 10	0 3 11	277 0 0	2,323 0 0	

B.

Statement showing progress made in Mollarpore Private Estate in record of rights and settlement of rents during the year covering the period from 1st *October* 1890 *to* 30th *September* 1891.

Division.	District.	Name of estate.	Total number of villages.	Number of villages in which record of rights has been completed—		Total number of raiyats in the villages in column 4.	Number of raiyats whose rent had been recorded and status determined.			Total rental of tenants whose rents have been settled.				Remarks.
				Up to 30th September 1890.	During the year under report (from 1st October 1890 to 30th September 1891).		Up to 30th September 1890.	During the year under report (from 1st October 1890 to 30th September 1891).	Total.	According to new settlement.	According to previous jummabundi.	Increase.	Decrease.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
										Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
Burdwan ...	Beerbhoom...	Mollarpore ...	45	...	45	3,997	...	3,997	3,997	2,003 0 0	1,726 0 0	277 0 0	...	

NUNDJEE,
Settlement Officer.

The 5th *November* 1891.

APPENDIX A. A.

No. AR, dated Camp Dumka, the 1st November 1891.

From—C. C. QUINN, Esq., Offg. Commissioner of the Bhágalpur Division and Sonthal Parganas,

To—The Director of the Department of Land Records and Agriculture, Bengal.

I HAVE the honour to forward herewith Mr. Carstairs' report of progress in the settlement of estates in the Sonthal Parganas for the half-year ending 30th September.

The report I think contains sufficient information on all material points, and I have little to add to it.

2. The important work undertaken during the half-year was the determination of rents in accordance with the rules drawn up in April last, and, as far as I have been able to judge, the work has been successfully performed. Rents have been provisionally fixed for the whole area, and they were explained to the ryots in 574 villages during the half-year under report, the explanations having been completed in the majority of the remaining villages in October.

3. The rents are generally admitted to be reasonable and fair, and the small number of objections as regards measurement and classification is good evidence that the work has been well and carefully done.

4. The increase of rent as calculated in accordance with the rules is about 35 per cent., but it must not be understood from columns 11 to 14 of statement B that all rents entered therein were finally settled within the half-year. As regards a considerable number of villages the rents were only provisionally settled, *i.e.*, subject to revision on objection at the time of explaining the khatian. The ultimate increase may therefore be something less than what is entered in column 13, but so far the revision has not as a rule affected the total rental of the village concerned, and it is not probable that there will be any considerable reduction of the aggregate total.

5. I am now on tour in the Sonthal Parganas, my chief object being to look into settlement work; and during the past week I have travelled with the Deputy Commissioner over a considerable tract under settlement in the Dumka subdivision. I have inspected the Assistant Settlement Officer's records, and have personally visited several villages and spoken to the raiyats, and have been on the whole favourably impressed by the way in which the work is being done. The Dumka circle contains 420 villages, and the khatians have been now explained in 400 of these, and most of the objections, which were generally not serious, have been disposed of.

No. $\frac{R}{2016}$, dated Dumka, the 31st October 1891,

From—R. CARSTAIRS, Esq., Deputy Commissioner, Sonthal Parganas,

To—The Commissioner of the Bhágalpur Division and Sonthal Parganas.

IN compliance with your No. 1950 of the 20th instant, I have the honour to submit my half-yearly report on settlement work in this district for the period ending the 30th September last. I have called for a report from the Subdivisional Officer of Rajmahal, but, doubtless owing to the Subdivisional Officer's absence on leave, this has been delayed. I will not detain my report for it, but send it on when it reaches me.

2. The main settlement work of the year has been that being conducted by Mr. Craven, Settlement Officer. This work was undertaken under the orders of Government, passed at various times, for 18 private estates, including those of Wards', comprising 1,430 villages. I need not lengthen this report by a detailed account of the work, but think it enough to say that by the 31st March last the whole area comprising 441,510 acres, of which 203,018 were cultivated and 238,492 were uncultivated, had been measured, and a total cost had been incurred of Rs. 1,00,456.

The payment taken from the proprietors was at the rate of 8 annas per acre for cultivated, and 3 annas for uncultivated land, a little over Rs. 146,200, so that there was a balance to credit in the estimate of Rs. 45,744.

3. The principal point remaining for determination was the rules for fixing rents, and these were drafted and published after the visit His Honour the Lieutenant-Governor paid to Dumka from the 8th to the 11th April, within the half-year under report. He also issued instructions for Mr. Craven's guidance.

4. The first work to be done was the calculation of the rents in accordance with the rules. The old calculations had to be revised and the rents in many cases altered. As this had to be done for some 55,000 holdings, whose land was classified under five classes, each with its own rates, this was a considerable addition to the recess work of checking the khasras of the last season's field work, comprising 411,300 plots. From the rough khatians fair khatians were written out. This work was done by the end of August.

5. Besides supervising the work of the office, Mr. Craven was engaged (*a*) in drawing up proceedings fixing the assessment in the 1,430 villages; (*b*) making enquiries as to the fitness of certain headmen.

6. From the 6th August Mr. Craven having fixed centres for the purpose, a list of which was submitted to you and approved, began the work of explaining the khatians to the

villagers. He started in the Dumka Circle, with his assistant Babu J. C. Bhanjo, then went on to the Godda Circle, where he started Babu Rash Behary Dutt, and then went on to Deoghur, where he had his assistant Babu B. D. Gupta, and taught him. He then handed over the Jamtara part of his work to the assistant and retained in his own charge the Deoghur part, which is, owing to the nature of the raiyats, the most troublesome.

7. As desired by His Honour, I spent a certain time with each of the four parties, and had an opportunity of seeing the way in which the work was done. In my opinion it has been done on a very good method, and any enquiry at which I have been personally present seemed to me to be made with patience, intelligence and thoroughness. I must have been with or in the neigbourhood of officers explaining rents for about three weeks in all. There did not seem to me to be any excitement or objection to the amounts of the rents, which have been quietly accepted. Not only has every ryot been told what land he has and what rent he has to pay, but every korphadar also has been told.

8. There have been objections, chiefly on the part of the persons who, from various causes, were absent at the time of measurement and who claimed that their lands have been recorded in the names of others. The objections to classification or measurement have been wonderfully few. Serious objections of a general character there appear to have been none, if we except a petition that was filed before me at Deoghur, suggesting that the old settlement should be maintained and the new not introduced. The orders were that all objections should be enquired into on the spot, before the officers left the neighbourhood, and I believe these orders have been generally acted on. The number of objections filed in all was 1,051, and of these 602 have been disposed of by the end of September It is obviously not possible to give an unlimited latitude as to filing objections, if we are to hope for a speedy close of the work. I consider that the Settlement Officer and his assistants have been careful in disposing of objections, and have given satisfaction thereby. Except as regards the removal of headmen declared unfit, no objections to Mr. Craven's proceedings have as yet been received by me, nor have I, while touring about, as I have been, in or near every part of the area under settlement, heard any expression of distrust or dissatisfaction, except such as is always to be expected from the mahajan-riyats near Deoghur. There is a class of men there who would grumble at anything whatever.

9. The progress made in explaining the khatians was up to the end of the half-year 574 villages, leaving 856 villages remaining to be done. The progress has been satisfactory, except in the Godda Division, where it has been slow. It is not likely that the work will be closed within the month of October, as originally desired by His Honour, but it is to be hoped that there will be no great delay. I will, when I see the Settlement Officer in a day or two, prepare an estimate of the time that will still be necessary to finish the work, and submit it. It is never possible to say exactly how long a work of this kind will take, and my instructions have always been rather to exceed the time than hurry on the work and leave it imperfect. The work has been somewhat delayed by want of forms, indented for in February and not yet supplied by the Stationery Office. To my personal knowledge, Mr. Craven and most of his subordinates, both gazetted and ministerial, have been working very hard, and spared no effort to bring the work to a completion.

10. As regards the financial position, the expenditure during the half-year was Rs. 22,622-2-10, bringing the total expenditure up to Rs. 1,23,078-2-10, so that by the end of the half-year we had still a sum of Rs. 23,122 to credit, enough to carry on with for six months more, if necessary, besides the value of the tents, furniture, and instruments. There is, therefore, no present fear of expenses out-running the estimates.

11. I append a copy of Mr. Craven's reports and his statements.

No. 389, dated Camp Satur, the 27th October 1891.

From—J. A. CRAVEN, Esq., Settlement Officer, Sonthal Parganas,
To—The Deputy Commissioner, Sonthal Parganas.

I HAVE the honour to submit the progress report of the settlement operations in this district for the half-year ending the 30th September last.

2. The field work was completed in March last.

3. As regards the work done during the period of report, the assessments for the 1,430 villages under settlement were fixed. This done, the individual rents of the raiats were calculated by applying the mauza rates to the several classes of land in each jote. The rateable reductions allowed to raiats under the rules were then ascertained and applied. There are about 55,000 holdings under settlement, and the cultivated lands are divided into five classes, viz., three of rice and two of bari lands. I mention these facts to give an idea of the computation work done during the period.* In addition to the fixing of the rents, the khasras of the last season 1890-91, comprising 411,300 plots, were checked, the rough khatians of these were made, and fair khatians written out. All this work was completed by the end of August.

* The exact number of holdings cannot be precisely stated just yet; as in the course of present enquiries it is found that the jotes have been subdivided since the measurements were made, and in many cases small jotes were at the time of measurement suppressed by headmen and others, who had the lands recorded along with their own jotes. These are now being ascertained and separated.

4. During the period of report I was occupied—

(*a*) in drawing up proceedings fixing the village assessments for the 1,430 villages under assessment;

(*b*) in making enquiries into cases of alleged misconduct on the part of headmen;
(*c*) in supervising the work in the office;
(*d*) and since the 6th of August last, in explaining the khatian jamabandis to raiyats in the interior.

My three assistants were employed—
(*a*) in disposing of objections and disputes in connection with the past season's work;
(*b*) in making enquiries for the record of rights;
(*c*) in explaining to the mohurirs the process of calculation of rents and in checking these;
(*d*) and in explaining the khatian jamabandis to the raiyats.

5. The head-quarters of the Settlement Office has been at Dumka, but it will be seen from the following that for the greater portion of the time myself and the assistants have been in the interior:—

Settlement Officer absent on tour				103.
Babu	R. B. Dutta,	Assistant	Settlement Officer,	160.
„	J. C. Bhanjo,	„	„ „	127.
„	B. D. Gupta,	„	„ „	135.

6. The accompanying statement shows the progress of work both as regards the explaining the khatian jamabandis to the raiyats in the villages and the writing up the records.

7. There are but few patwaris in the Sonthal Parganas. As far as it was possible, village men have been instructed in measurement and classification, and it is surprising how well some of these men now understand the settlement khasras.

8. The statements A and B prescribed by Government accompany this report.

STATEMENT A.

Statement showing the Estates under Survey and Settlement of Rent during the half-year ending 30th September 1891.

DIVISION.	DISTRICT.	Number and name of estates.	Total number of villages under survey and settlement.	ESTIMATED AREA IN ACRES.			Whether surveyed by professional or non-professional agency.	AREA SURVEYED IN ACRES.—						NUMBER OF VILLAGES OF WHICH THE RECORDS HAVE BEEN HANDED OVER BY THE SURVEY TO THE SETTLEMENT OFFICER.			TOTAL COST UP TO—			RATE PER ACRE.	INCREASE OF RENT.	REMARKS.
								Up to 31st March 1891.			During the half year under report.						31st March 1891.	During the half-year under report.	Total.			
				Cultivated.	Uncultivated.	Total.		Cultivated.	Uncultivated.	Total.	Cultivated.	Uncultivated.	Total.	Total area surveyed.	Up to 31st March 1891.	During half-year under report.	Survey and settlement.	Survey and settlement.	Survey and settlement.	Survey and settlement.	Actually obtained.	
1	2	3	4	5 (a)	5(b)	5(c)	6	7(a)	7(b)	7(c)	8(a)	8(b)	8(c)	9	10	11	12 & 13	14 & 15	16 & 17	18 & 19	20	21
																					Rs. A. P.	
Bhágalpur ...	Sonthal Parganas.	1. Punasi	69	4,821	10,933	15,754	Non-professional.	4,821	10,933	15,754	...	...	...	15,754	None.	None.	.....	.....	.....	.....	699 12 0	
		2. Dhonoria	15	1,785	1,488	3,273		1,785	1,488	3,273	...	...	...	3,273			.....	.....	.....	.....	437 4 0	
		3. Tangedi	8	946	1,103	2,049		946	1,103	2,049	...	...	...	2,049			.....	.....	.....	.....	304 4 0	
		4. Deoghorabad ...	4	468	490	958		468	490	958	...	...	...	958			.....	.....	.....	.....	395 12 0	
		5. Narayanpur ...	66	6,946	10,352	17,298		6,946	10,352	17,298	...	...	...	17,298			.....	.....	.....	.....	2,052 4 0	
		6. Sitakata village, taluk Pusdari.	1	77	237	314		77	237	314	...	...	...	314			.....	.....	.....	.....	48 2 0	
		7. Pusia	227	35,335	65,986	1,01,321		35,335	65,986	1,01,321	...	...	...	1,01,321			.....	.....	.....	.....	6,280 0 0	
		8. Belpatta containing 12 taluks.	229	35,888	35,015	70,903		35,888	35,015	70,903	...	...	...	70,903			.....	.....	.....	.....	9,545 12 0	
		9. Lakhanpur ...	39	4,193	9,225	13,418		4,193	9,225	13,418	...	...	...	13,418			1,00,456 0 0	22,622 2 10	1,23,078 2 10	0 4 6	1,468 0 0	
		10. Beludabar ...	14	1,513	1,218	2,731		1,513	1,218	2,731	...	...	...	2,731			.....	.....	.....	.....	519 8 0	
		11. Dumka estate ..	28	4,792	5,602	10,394		4,792	5,602	10,394	...	...	...	10,394			.....	.....	.....	.....	1,475 0 0	
		12. Sunkara	110	21,512	30,030	51,542		21,512	30,030	51,542	...	...	...	51,542			.....	.....	.....	.....	6,035 12 0	
		13 Barkope	201	34,021	7,162	41,183		34,021	7,162	41,183	...	...	...	41,183			.....	.....	.....	.....	12,341 8 0	
		14. Belbathan ...	35	13,907	12,065	25,972		13,907	12,065	25,972	...	...	...	25,972			.....	.....	.....	.....	2,523 0 0	
		15. Sarayah	91	12,560	9,399	21,959		12,560	9,399	21,959	...	...	...	21,959			.....	.....	.....	.....	3,223 0 0	
		16. Kiltabhadrain ...	1	39	5	44		39	5	44	...	...	...	44			.....	.....	.....	.....	.....	
		17. Rohini	255	20,534	32,776	53,310		20,534	32,776	53,310	...	...	...	53,310			.....	.....	.....	.....	7,195 0 0	
		18. Banhaiti	37	3,679	5,406	9,085		3,679	5,406	9,085	...	...	...	9,085			.....	.....	.....	.....	920 14 0	
		Total ...	1,430	2,03,018	2,38,492	4,41,510		2,03,018	2,38,492	4,41,510	...	...	...	4,41,510			1,00,456 0 0	22,622 2 10	1,23,078 2 10	.....	55,491 12 0	

NOTE.—The cost of each estate cannot be shewn separately, as there is no separate account for each estate.

B.

Statement showing progress made in Temporarily-settled Tracts in Record of Rights and Settlement of Rents up to 30th September 1891.

Division.	District.	Name of Estate.	Total number of villages.	Number of villages in which record of rights has been completed—		Total number of raiyats in the villages in column 4.			Number of raiyats whose rents had been recorded and status determined.			Total rental of tenants whose rents have been settled.				Remarks.
				Up to 31st March 1891.	During half-year under report.	Raiyats.	Sub-raiyats.	Total.	Up to 31st March 1891.	During half-year under report.	Total of columns 8 and 9.	According to new settlement.	According to previous jamabandi.	Increase.	Decrease.	
1	2	3	4	5	6	7(*a*)	7(*b*)	7(*c*)	8	9	10	11	12	13	14	15
												Rs. A.	Rs. A.	Rs. A.	Rs. A.	
Bhágalpur ...	Sonthal Parganas.	Poonasi	69	69	...	490	234	724	...	724	724	3,052 12	2,353 0	699 12	...	
		Dhanoria	15	15	...	200	158	358	...	358	358	1,560 12	1,087 8	473 4	...	
		Tangidih	8	8	...	144	45	189	...	189	189	1,102 0	797 12	304 4	...	
		Deogharabad	4	4	...	95	53	148	...	148	148	1,189 4	793 8	395 12	...	
		Narainpur	66	66	...	2,816	696	2,512	...	2,512	2,512	6,220 8	4,168 4	2,052 4	...	
		Sita Katta, taluk Pindari ...	1	1	...	19	9	28	...	28	28	144 4	96 2	48 2	...	
		Pabia	227	...	227	7,148	1,250	8,398	...	8,398	8,398	25,807 8	19,527 8	6,280 0	...	
		Belpatta containing 12 taluks	229	79	150	7,847	1,591	9,438	...	9,438	9,438	31,744 8	22,198 12	9,545 12	...	
		Lakhanpur	39	39	...	898	121	1,019	...	1,019	1,019	4,805 4	3,337 4	1,468 0	...	
		Beludabar	14	14	...	285	97	382	...	382	382	1,756 12	1,246 4	510 8	...	
		Dumka estate	28	18	10	1,028	356	1,384	...	1,384	1,384	6,986 0	5,311 0	1,675 0	...	
		Sankasali	110	110	...	4,111	782	4,893	...	4,893	4,893	20,405 8	14,369 12	6,035 12	...	
		Barkope	201	201	...	8,293	1,252	9,545	...	9,545	9,545	58,258 0	45,916 8	12,341 8	...	
		Telbathan	35	35	...	1,090	695	1,785	...	1,785	1,785	7,082 0	4,759 0	2,323 0	...	
		Sareyah	91	91	...	2,904	1,077	3,981	...	3,981	3,981	13,017 8	9,794 8	3,223 0	...	
		Kitta Bhadrain	1	1	...	30	12	42	...	42	42	... ...	... ...	... ...	...	
		Rohini	255	255	...	5,141	3,577	8,718	...	8,718	8,718	27,405 8	20,210 8	7,195 0	...	
		Banhati	37	37	...	628	448	1,076	...	1,076	1,076	4,280 2	3,359 4	920 14	...	
		Total ...	1,430	1,043	387	42,177	12,443	54,620	...	54,620	54,620	2,14,118 2	1,59,326 6	55,491 12	...	

Statement showing progress in explaining the khatian jamabandis and in writing up the several records connected with the settlement.

1	2	3	4	5	6	7	8	9	10
DISTRICT.	Number of khatian jamabandis finally explained.	Number of local enquiries made in connection with the khatians.	Number of khasras corrected in accordance with the khatian after they have been explained.	Number of abstract khatian jamabandis prepared in triplicate.	Number of record of rights completed in original.	Number of khatians copied in triplicate.	Number of record of rights copied in triplicate.	Number of pottas and kabuliyats prepared in duplicate.	REMARKS.
Sonthal Parganas ...	574	602	434	448	792	500	471	330	

CAMP. SATAR,
The 27th October 1891.

J. A. CRAVEN,
Settlement Officer.

APPENDIX B. B.

No. 408, dated Camp Bishenpur *viâ* Deoghur, the 7th November 1891.

From—J. A. CRAVEN, ESQ., Settlement Officer, Sonthal Parganas,

To—The Director of Land Records and Agriculture, Bengal.

I HAVE the honour to submit my annual report of settlement operations in this district for the period 1st October 1890 to 30th September 1891.

2. The field work that remained to be done at the close of the field season 1889-90 was the survey and measurement of 420 villages. On the 1st November 1890 I took the field with two assistants, Babus Ras Behary Dutt and Jogendra Chandra Bhanja, to complete this work.

3. There were three field parties, one being under my immediate charge, and the two others under the two assistants, while I exercised also general supervision. In the middle of December, a third Assistant Settlement Officer, Babu Balaram Das Gupta, was appointed to relieve me of the personal charge of my party, which was then working in the Jamtara subdivision. The supervising staff was further strengthened in February last by the appointment of a canoongoe to each party.

4. The party working under Babu Ras Behary Dutt, in the Godda subdivision, surveyed the boundaries and measured in detail the fields of 176 villages, covering an area of 31,709 acres of cultivated land and 12,753 acres of uncultivated land, comprised in 103,900 plots.

The Dumka party under Babu Jogendra Chunder Bhanja surveyed the boundaries and measured in detail 66 mauzas, consisting of 13,606 acres of cultivated land and 20,560 acres of uncultivated land ; the whole area being comrpised in 97,400 plots.

The party in Jamtara under Babu Balaram Das Gupta surveyed the boundaries and measured in detail 178 villages, with an area of 29,160 acres of cultivated land and 49,376 acres of uncultivated land, consisting of 210,000 plots.

5. The boundaries were surveyed with plane table, compass and chain, and the fields measured with 30-feet chain. The writing up of the khasras and the plotting of the fields was done on the field as the work proceeded.

6. The field work of the three parties was completed on the dates below mentioned :—

The Dumka party, ... 21st January 1891.
„ Godda „ ... 28th February „
„ Jamtara „ ... 21st March „

7. As the rules for the fixing of rents were not passed until April last, no rents could be fixed during the first half-year.

Statement B for that period is therefore blank; and the statement submitted with my No. 390, dated the 29th ultimo, shows the whole of the progress made in record of rights and settlement of rents.

8. Statement A is herewith submitted. I also submit the accompanying statement showing the miscellaneous work done by myself and assistants in connection with the settlement during the field season :—

HEADS OF WORKS.	Dumka.	Jamtara and Deoghur.	Godda.	Total.
Objections disposed of ...	527	936	447	1,910
Boundary disputes settled ...	141	247	130	518
Enquiries for record of rights ...	280	506	328	1,114
Enquiries for the fixing of rates ...	140	316	236	692

9. The time spent in camp by myself and my assistants during the period 1st October 1890 to 31st March 1891 is given below. The information under this head for the months April to September 30th has already been furnished in my half-yearly report recently submitted :—

Settlement Officer	133	days.
Babu J. C. Bhanga, Assistant Settlement Officer, Dumka ...	143	„
„ R. B. Dutt, „ „ „ Godda ...	151	„
„ B. D. Gupta, „ „ „ Jamtara ...	151	„

10. A full report will shortly be submitted as soon as the settlement is finished.

A.

Statement showing the Estates under Survey and Settlement of Rent during the year ending the 30th September 1891.

Division.	District.	Number and name of estate.	Total number of villages under survey and settlement.	Estimated area in acres.	Whether surveyed by professional or non-professional agency.	Area surveyed in acres. — Up to 30th September 1890. — Cultivated.	Uncultivated.	Total.	During the year under report. — Cultivated.	Uncultivated.	Total.	Total area surveyed (in acres).	Number of villages of which the records have been handed over by the Survey to the Settlement Officer — Up to 30th September 1890.	During the year under report.	Total cost — Up to 30th September 1890.	During the year under report.	Total.	Rate per acre. — Survey and settlement.	Increase of rent. — Actually obtained.	Remarks.
1	2	3	4	5	6	7(a)	7(b)	7(c)	8(a)	8(b)	8(c)	9	10	11	12 & 13	14 & 15	16 & 17	18 & 19	20 & 21	22
															Rs. A. P.	Rs. A. P.	Rs. A. P.	A. P.	Rs. A. P.	
		1 Joonasi	69	...		4,821	10,933	15,754	...	...	...	15,754	...	...	...	...	.....	...	699 12 0	The cost of each estate cannot be shown separately, as there is no separate account for each estate.
		2 Dhanoria	15	...		1,785	1,488	3,273	...	...	...	3,273	...	...	...	...	.....	...	473 4 0	
		3 Tangidih	8	...		946	1,103	2,049	...	...	...	2,049	...	...	...	...	.....	...	304 4 0	
		4 Deogharabad ...	4	...		468	490	958	...	...	...	958	...	...	...	...	.....	...	395 12 0	
		5 Narayanpur ...	66	...		6,946	10,352	17,298	...	...	...	17,298	...	...	...	...	.....	...	2,052 4 0	
		6 Sitakatta	1	...		77	237	314	...	...	...	314	...	...	...	...	.....	...	48 2 0	
		7 Pabia	227	...		6,175	16,610	22,785	29,160	49,376	78,536	101,321	...	...	...	...	.....	...	6,280 0 0	
		8 Rohini	255	...		20,534	32,776	53,310	...	...	...	53,310	...	...	...	...	.....	...	7,195 0 0	
		9 Bonhaiti	37	...		3,679	5,406	9,085	...	...	...	9,085	...	...	75,452 0 1	47,626 2 9	1,23,078 2 10	4 6	920 14 0	
Bhágalpur...	Sonthal Parganas.	10 Belpatta (containing 12 taluks) ...	229	...	Non-professional.	35,404	34,383	69,787	484	632	1,116	70,903	...	...	...	...	.....	...	9,545 12 0	
		11 Lakhanpur ...	39	...		4,193	9,225	13,418	...	...	...	13,418	...	...	...	...	.....	...	1,468 0 0	
		12 Belvodabor ...	14	...		1,513	1,218	2,731	...	...	...	2,731	...	...	...	...	.....	...	510 8 0	
		13 Dumka estates ...	28	...		4,792	5,602	10,394	...	...	...	10,394	...	...	...	...	.....	...	1,675 0 0	
		14 Sankerra	110	...		8,390	10,102	18,492	13,122	19,928	33,050	51,542	...	...	...	...	.....	...	6,035 12 0	
		15 Barkope	201	...		14,911	3,813	18,724	19,110	3,349	22,459	41,183	...	...	...	...	.....	...	12,341 2 0	
		16 Bhadrain	1	...		...	...	...	39	5	44	44	...	...	...	...	.....	...	...	
		17 Saraya	91	...		...	...	...	12,560	9,399	21,959	21,959	...	...	...	...	.....	...	3,223 0 0	
		18 Belbathan ...	35	...		13,909	12,065	25,974	...	...	...	25,974	...	...	...	...	.....	...	2,323 4 0	
			1,430	...		128,543	155,803	284,346	74,475	82,689	157,164	441,510	...	...	75,452 0 1	47,626 2 9	1,23,078 2 10	4 6	55,491 12 0	

Dated Camp Bishenpur, *viâ* Deoghur;
The 7th November 1891.

J. A. Craven,
Settlement Officer, Sonthal Parganas.

R. D'R. & others—Reg. No. 3993J—1,000—24-3-92.

REVENUE DEPARTMENT.

LAND REVENUE.

No. 150T—R.

DARJEELING, THE 15TH MAY 1892.

RESOLUTION.

READ—

The Annual Report of the Director of the Department of Land Records and Agriculture, Bengal, for the year ending 30th September 1891.

In September 1891 the Lieutenant-Governor issued orders that in future the Director should furnish two settlement reports in the course of the year, viz., (I) financial, for the period from the 1st April to the 31st March, consisting of a brief, mainly statistical and financial, account of the progress of settlement work, and (II) administrative, for the period from the 1st October to 30th September, containing a full account of the progress of survey and settlement work in the Province. It was laid down that the latter report should ordinarily be due to the Board on the 15th November, and to the Local Government on the 15th December. As the Director was absent on privilege leave until early in November, punctual submission of the first report was not expected, but he was desired to prepare it as soon as possible after his return. Instructions were given in the Government Resolution of the 28th September 1891, on Mr. Finucane's annual report for the financial year 1890-91, with a view to the preparation of the report in the manner required by Government. The present report, which is the first Administrative Settlement Report furnished under the new system, is a great improvement on the reports previously laid before Government. It bears, however, so late a date as the 18th March 1892, and was not forwarded by the Board until the 14th April. The Lieutenant-Governor is aware that Mr. Finucane has been constantly on tour since his return from leave, and it appears that he has been unable to obtain the material required by him from the Deputy Surveyor-General and several of the Settlement Officers. It is anything but satisfactory that the survey reports for Jalpaiguri, the Burdwan Raj khas mahals, Chittagong and Sarail, were not received by Mr. Finucane until the 11th to 30th of January (although they referred to the survey year which ends on 30th September), and that no report was furnished for Orissa. His Honour trusts that, with the appointment of Colonel J. E. Sandeman as Director of Bengal Surveys, all such irregularities will cease. No explanation has been offered for the delay in the local settlement reports. Sir Charles Elliott is willing to make due allowance for the change of system, and he agrees with Mr. Finucane in hoping that, timely notice having been given of what is required, the difficulties lately encountered will disappear, and that the next annual report will be submitted on the prescribed date.

2. Mr. Finucane has followed an intelligent order in dealing consecutively with (1) Government estates and temporarily-settled tracts, which are necessarily the most important settlement operations from a revenue point of view, (2) Wards' estates, and (3) private estates. In accordance with the orders on his last annual report, the Director has placed his account of the Orissa, Chittagong and Jalpaiguri settlements in the forefront of his report. Apart from the special position to be assigned to the Orissa, Chittagong and Jalpaiguri operations, Government also desired that an intelligent geographical order should be adopted both as regards the civil divisions and the districts

and estates in those divisions. These instructions appear to have escaped notice, for the order observed has been as follows:—

(1) Government estates.		(2) Wards' estates.		(3) Private estates.	
Division.	District.	Division.	Estate.	Division.	District.
Dacca ...	Backergunge.	Burdwan ...	Burdwan Raj Khas Mahals.	Burdwan ...	Midnapore.
Chittagong	Tippera.			Ditto ...	Birbhum.
Ditto ...	Noakhali.	Bhágalpur	Srinagar-Banaili.	Rajshahi ...	Dubalhati (Rajshahi).
Dacca ...	Dacca.				
Burdwan ...	Midnapore.	Dacca ...	Dakhin Shahbázpur.	Chittagong	Tippera.
Presidency	Nadia.			Bhágalpur	Sonthal Parganas.
		Chittagong	Sarail (Tippera).		
		Orissa ...	Kujong and Kanika.		

It is evident that geographical order has not been carefully or consistently maintained, and the Lieutenant-Governor trusts that it will not be necessary to again repeat his orders on this point. The appendices have been properly totalled as desired by Government.

3. *Orissa.*—The Survey Department, as already mentioned, has furnished no report of its work in Orissa. But it appears that 361 square miles were cadastrally surveyed by the end of September 1890, and 687 square miles between that date and the end of September 1891, total 1,048 square miles. The total expenditure on the survey is stated to have been Rs. 2,19,031, or just Rs. 209 a square mile. This is a considerable increase on the rate, Rs. 165 per square mile, previously reported. It is mentioned that Mr. Patterson, the survey officer, unfortunately overlooked the survey rule which requires *parchas* or jamabandi slips to be given to the raiyats at the time of survey; also the errors and inaccuracies of the khasras prepared by the Survey Department delayed the work of attestation, and even now the records of all the villages measured by Mr. Patterson before last rains have not all been sent in. With regard to these and other matters which have come to his notice, the Lieutenant-Governor thinks it right to put on record his opinion that Mr. Patterson was entirely unfit for the position in which he was placed by the Survey Department, and that a hopeless block would have ensued had that officer not left Orissa, and had Colonel Sandeman not come in to set matters straight. Mr. H. R. Reily was in charge of the settlement since he joined on 16th February 1891 to the end of the year under report. He was assisted by Mr. Walsh, a Civilian of experience, Mr. Ambica Charan Sen, Mr. Tahiruddin Ahmed, and Mr. Baroda Charan Mitra, Statutory Civilians, Babus Hurish Chandra Roy and Chaku Lal Sarkar, besides others who from ill-health or other causes did not remain long in the Department. There were six circles and nine Assistant Settlement Officers in charge of them at different times, who were, it is said, in the field on an average 63 days each. This information would have been more valuable if the time during which they were on duty had also been mentioned. In future the Director should state for each officer the number of days (*a*) on duty, (*b*) on leave, (*c*) on tour. The six circles have lately, *i.e.*, in March 1892, been re-arranged under eight officers. The demarcation work has been transferred to the Survey Department. Up to 30th September the status of 29,190 tenants was determined and their rents recorded, and 138,042 plots were attested over an area of 83,752 acres. Jamabandi slips are now being distributed by the Survey Department, and it is hoped that in future each officer will be able to attest daily many more than 600 plots, which is the standard of work laid down, and to some extent attained, in Chittagong. No rents were settled and no land revenue assessed. Out of the 464 patwáris in Orissa, 277 were trained in survey, but their work is found to be more expensive than that of amíns. Arrangements have been made also for the utilization of the kánungos as required. The expenditure on settlement during the portion of the year ending 30th September 1891, during which the work was in progress, was Rs. 45,598.

The survey and settlement of Banki, in Cuttack, were completed before March 1891, at an average cost of 7 annas and 10 pies per acre. The estimate

for a non-professional survey and for settlement was Rs. 1,64,411 for the 76,800 acres of the estate: the actual cost of a professional survey has been Rs. 25,097 and of the settlement Rs. 12,598, total Rs. 37,695, the increase of revenue obtained being Rs. 7,974. The final report of the proceedings has not yet been received. The Lieutenant-Governor has already characterised this delay as very unsatisfactory; a full explanation will be required from the Settlement Officer.

4. *Chittagong.*—Mr. Slack was in charge of the operations till the 11th of July, and Mr. C. G. H. Allen for the rest of the year under report. They were assisted by Mr. Atul Krishna Rai (for one month only), Babu Durga Charan Ghosé, Babu Romesh Chunder Das, as Assistant Settlement Officers. The demarcation of the Sadar sub-division was completed with the exception of the hilly portions, the work done comprising 465 villages. The cadastral survey of 380 square miles had been accomplished by September 1890, and during the season under report 348 square miles were done, besides 112 square miles of topographical work. After September 1891 534 square miles of cadastral and 252 of new topographical survey remained, besides some important traverse work. Arrangements have been made to accelerate the rate of progress. Since the 1st January 1891 the work of preparing the records required for attestation in the Sadar sub-division has been made over to the Settlement Department. The records of 212 villages with an area of 205 square miles were handed over for settlement work. The Khanapuri of 477,682 plots was completed, and the entries regarding 306,463 plots were revised. In the Sadar sub-division the status of 33,679 tenants was determined and their existing rents were recorded. No fair-rent decisions were passed, and no land revenue was assessed. A scheme has been sanctioned for strengthening and utilising the khas tahsil establishment for the maintenance of the records.

In Old Thána Ramu the survey had been completed by September 1890. The settlement work was mainly conducted by Babu Jogéndra Kumar Bose, who completed the attestation, dealing with the lands of 15,389 tenants, disposed of 558 original suits and 1,062 objections, and passed eight fair-rent decisions. Fair-rent decisions have been passed in 43 of the 50 villages in Ramu. Soil class maps are now in preparation and statements of the revenue assessable on the average soil class rates are being drawn up. The settlement expenditure amounted, during the year, to Rs. 58,892 in the Sadar and Rs. 15,389 in Ramu, the cost of the survey being Rs. 1,32,540 in the Sadar sub-division. A reasonable standard of work expected from each amín and Assistant Settlement Officer has been drawn up in Chittagong, but from the monthly progress reports received, His Honour has reason to fear that the standard required is not attained.

5. *Jalpaiguri.*—By the end of the year under report 765 square miles had been cadastrally surveyed, being practically the whole of the area under settlement. Besides this 174 miles of forest and 61 of waste lands had been surveyed, leaving 290 of forest and 340 of waste lands for the survey work of the current year. The records of 3,430 jotes were made over to the Settlement Officer. An area of 162,063 acres in 3,507 jotes in the Mainaguri tahsil was assessed during the year, giving an increase of Rs. 36,210 revenue, but the revised assessment has not been finally passed by the Commissioner. Mr. Sunder was in charge throughout the year, and was on tour for 217 days. He records the constant struggles of his subordinates with fever; he has at different times had five assistants, but the climate of the Duars has necessitated several changes among them. The three men last appointed have been employed in pargana Moraghat in collecting information preparatory to the settlement of the rates on jotes in the Falakata tahsil. It is unsatisfactory to find that some of the later records of the Survey Department were so carelessly prepared that they had to be returned for revision. The increase of revenue, amounting to Rs. 60,000, expected in the Mainaguri tahsil, is chiefly due to the extension of cultivation on nearly every jote, to the recovery of the amount which was remitted seven years ago under the reduction scheme then advocated and apparently sanctioned under misapprehension, and to the application of the rates approved for this settlement. Considerable delay has been caused by the necessity of requiring the people to record the mutations of ownership and to pay the fees due on this account. The cost of the survey during the year

is separately stated to have been Rs. 1,03,658 or Rs. 1,10,784. Such discrepancies should be cleared up before this annual report is laid before Government. The expenditure on settlement was Rs. 30,459.

6. The work done in the settlement operations in progress, other than the important proceedings mentioned in the preceding paragraphs, has been sufficiently summarized in the Director's report, to which reference may be made. As the details have been reviewed for the financial year 1890-91, it is not necessary, especially at this late date, to review them again. A very few observations only are now required. In future the Administrative Settlement Report for the year ending 30th September will be the main report of the year, and the principal comments of Government will be reserved for the Resolution on it. The Srinagar-Banaili settlement, which has been completed, will shortly come under separate review. The Lieutenant-Governor understands that the dispute as to the standard of measurement in pargana Akberabad in the Malda district has been settled *ex parte*. In Backergunge there were 27 Government estates under settlement under the Tenancy Act, and up to the close of the year under report the proceedings had cost Rs. 30,015. The Director does not mention the enhanced revenue to be set against this expenditure, but from the statements furnished by the Collector of Backergunge it appears that an increase of revenue to the amount of Rs. 5,639 has already been obtained from seven of the villages, *i.e.*, estates, and that a total increase of Rs. 25,114 is expected from the 27 estates. An explanation has been given of the discrepancies noticed in paragraph 11 of the Government Resolution of the 28th September 1891 in the number of estates under settlement. It is a matter for satisfaction that the compromise accepted by the Manager and the raiyats in Sujamutha has been worked out and brought into effect. The Lieutenant-Governor concurs with the Director that the number of days spent on tour by the Settlement Officer, Dwijendra Lall Roy, viz. 65, in spite of the orders repeatedly given to him to go into every village and dispose of objections on the spot, was utterly inadequate. The Manager of the Burdwan Raj will be informed of the want of co-operation on the part of the Raj officials which has entailed delay and extra expense.

7. The total area of Government estates and temporarily-settled tracts under survey and settlement during the year was 9,090 square miles, of which 2,381 miles had been surveyed prior to, and 1,397 miles were surveyed during, the year under report, total 3,778 square miles; the total expenditure on survey and settlement from the beginning of the operations to the end of the year being Rs. 13,04,875, and the increase of revenue actually obtained being Rs. 1,10,078, or 8·44 per cent. on the outlay. This amount does not represent anything like the increase that will be obtained when the settlement operations are completed in Chittagong, Orissa, and Jalpaiguri, which are expected to yield an increase of revenue, amounting to about eight lakhs of rupees in addition to what has been actually obtained. The total area of wards' estates under settlement is 2,226 square miles, of which 1,945 square miles had been surveyed prior to, and 50 square miles were surveyed during, the year under report, total 1,995 square miles; the increase of rental actually obtained amounted to 6·96 per cent. on the outlay. The total area of private permanently-settled estates under survey and settlement was 815 square miles (inclusive of the Sonthal Parganas estates), the increase of rental obtained being 42·49 per cent. on the outlay.

From a revenue point of view, these results may be considered to be satisfactory. There has nowhere been any serious opposition to the proceedings, nor has any serious dissatisfaction with the results been expressed, on the part of either the landlords or tenants concerned.

8. Sir Charles Elliott agrees with the Board that much labour has been bestowed on the preparation of the Director's report, and that valuable financial results will be obtained from the operations under notice. He has had occasion more than once to state the importance which he attaches to surveys and settlements on administrative and statistical grounds, and his views are corroborated by everything that comes before him, especially in a Province dominated, as Bengal is, by the permanent settlement. The work done by Mr. Finucane in supervising the Settlement Department again merits the acknowledgments of Government.

ORDER—Ordered that the Resolution be published in the *Calcutta Gazette*.

Ordered, also, that a copy of the Resolution be submitted to the Government of India in the Revenue and Agricultural Department for information, and that a copy be forwarded to the Board of Revenue, Lower Provinces, for information and guidance.

By order of the Lieutenant-Governor of Bengal,

C. E. BUCKLAND,

Secretary to the Govt. of Bengal.

No. 151T—R.

COPY forwarded to the Secretary to the Board of Revenue, Lower Provinces, Land Revenue Department, for information and guidance, with reference to his letter No. 361A, dated the 14th April 1892.

No. 152T—R.

COPY forwarded to the Appointment Department of this Office for information.

No. 153T—R.

COPY forwarded to the Director of the Department of Land Records and Agriculture, Bengal, for information and guidance.

By order of the Lieutenant-Governor of Bengal,

C. E. BUCKLAND,

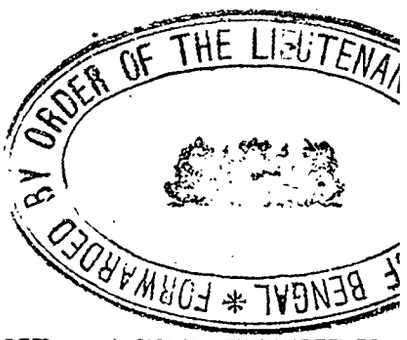
Secretary to the Govt. of Bengal.

DARJEELING,
The 15th May 1892.

H. P.—Reg. No. 12000—1,090—18-5-92.

ANNUAL AGRICULTURAL REPORT

OF THE



DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

BENGAL,

For the year ending 31st March 1893.

Calcutta:

PRINTED AT THE BENGAL SECRETARIAT PRESS.

1893.

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OFFICE OF DIRECTOR OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BENGAL.

No. 1917*Agri.*

FROM W. C. MACPHERSON, ESQ., C.S.,

Offg. Director of the Department of Land Records and Agriculture, Bengal,

TO THE SECRETARY TO THE BOARD OF REVENUE, L.P.

Dated Calcutta, the 21*st July* 1893.

SIR,

I HAVE the honour to submit the Report of this Department on agricultural enquiry, agricultural improvement, and agricultural statistics for the year ending 31st March 1893. This is the eighth annual report of this Department of this nature. It is this year submitted separately from my report on Settlements for the year ending 31st March 1893, under orders conveyed in your letter No. 567A., dated the 25th April 1893.

2. The Report contains information under the following heads:—

Chapter I.—Summary of the outturn of the harvests of the year; agricultural statistics.

Chapter II.—Analysis of districts; rent and revenue in precarious tracts; measures taken to encourage emigration to Burmah.

Chapter III.—Arboriculture; silk experiments and eradication of pebrine; locusts.

Chapter IV.—Agricultural experiments and improvements; agricultural implements; applications for patents; agricultural exhibitions; experiments of the Agri-Horticultural Society.

Chapter V.—The Bengal Veterinary Institution; cattle-breeding.

Chapter VI.—Officers of the Department.

3. A notice of the harvests of the year is for the first time given in this Report. The establishment of the Bengal Veterinary Institution was noticed in Chapter V of the Report of this Department for the year ending 31st March 1892. The other chapters are inserted in accordance with orders contained in the Government of India's Circular No. 54A, dated the 28th April 1884, a copy of which was forwarded to this office under cover of Revenue Department letter No. 1180T.R., dated the 25th August 1885.

CHAPTER I.

SUMMARY ACCOUNT OF THE HARVESTS OF 1892-93; CROP FORECASTS AND OTHER STATISTICS PUBLISHED BY THIS DEPARTMENT.

1. Final note on the bhadoi crops, 1892, dated 15th November 1892.
2. Final note on the winter rice crop of 1892, dated 15th November 1892.
3. Note on the rabi crops, 1892-93, dated 15th April 1893.
4. Final note on the wheat crop of 1892-93, dated 5th May 1893.

4. The following summary of the harvests of 1892-93 has been compiled from the notes published by this Department, which are cited in the margin:—

Bhadoi crops of 1892.—The season was favourable. The total area of food and non-food crops cultivated was returned as 15,805,498 acres, which was probably in excess of the normal. Out of the 45 districts, 27 reported a better crop than that of 1891, and seven reported equal crops. The districts which reported crops worse than those of 1891 were those of the Burdwan and Orissa Divisions, the 24-Parganas, Chittagong Hill Tracts and Singhbhum. The crop did not quite fulfil its

promise in the eastern districts on account of excessive rain and flood. But North Bengal, Bihar, Chota Nagpur and Chittagong had generally excellent crops. The outturn for the whole province was probably 16 annas, or a full average crop, against 12 annas in 1891.

Winter rice crop of 1892.—The total area cultivated with winter rice in 1892 was returned as 30,172,678 acres against 29,506,861 acres in 1891. Thirty-four out of 45 districts reported a better crop than that of 1891; five districts reported equal crops, and five, viz., Bankura, Midnapore, Hooghly, Manbhum, and Singhbhum, reported worse crops. The outturn for the whole province was estimated in the preliminary note published by this Department as 16 annas. The scanty rainfall of October, however, marred the good prospects in many districts in Central Bengal, Bihar and Chota Nagpur, and the estimate for the whole province was reduced in the Final Note to 14 annas, as against 10 annas estimated for the crop of 1891.

Rabi crops of 1892-93.—The early part of the season of 1892-93 was on the whole favourable for the rabi crops, though rain was deficient in October in Bihar and North Bengal. Excessive rain at the end of February and beginning of March, however, was injurious to the crops. The area sown was generally returned as larger than that sown in the season 1891-92. In 30 out of the 45 districts, the outturn was estimated at 12 annas and upwards, and in 14 districts as between 8 annas and 12 annas. The only district which returned less than half a crop was the Chittagong Hill Tracts. On the whole, and having regard to the tendency to under-estimate outturn, it was estimated in this Department Note, dated 15th April 1893, that the rabi crops were not less than 14 annas of an average crop, and that they might be as much as 16 annas as against 9 annas only estimated for the rabi crops of 1891-92.

Taking the Lower Provinces as a whole, the supply of food-grains produced during the year appears to have been about an average supply. Only in the districts of the Burdwan Division, except Birbhum, and in Manbhum, Singhbhum, the Satkhira subdivision of Khulna, Puri, and the Chittagong Hill Tracts, where the winter rice crop was considerably injured by want of timely rainfall, does the supply of food-grains appears to have been much below the average.

5. *Jute.*—A good jute crop was obtained during the year. The season was favourable for the crop in the northern and eastern districts, where it is principally cultivated, though damage was caused in some parts by excessive rain and floods. In the forecasts of the jute crop issued by this Department on the 1st July and 26th August 1892, the amount of jute (exclusive of cuttings and rejections) likely to be exported was estimated at 10,000,000 cwt., or 28 lakhs of bales. The actual quantity of jute (exclusive of cuttings and rejections) exported during the first 11 months of the current jute year (1st August 1892 to 30th June 1893) has amounted to 26,19,906 bales. It is probable that the total will reach 26½ lakhs of bales by the 31st July, the end of the jute year.

6. *Agricultural statistics.*—The following forecasts and reports regarding crops were prepared and published by this Department during the year:—

(1) Forecasts of the outturn of rabi crops of 1891-92, and of important special crops, viz., sugarcane, tobacco, mulberry and poppy, issued on the 6th May 1892.

(2) Preliminary forecast of the bhadoi crops for the year 1892 submitted to Government on the 24th October 1892.

(3) First forecast of winter rice showing the area and prospects of the crop up to 15th September 1892, issued on the 24th October 1892.

(4) Final harvests of the bhadoi crops 1892 submitted to Government on 23rd November 1892.

(5) Final forecast of the winter rice crop submitted on the 23rd November 1892.

Special and separate forecasts for particular crops and other Statistical Reports were also furnished as follows:—

(6) *Wheat.*—Final forecast of the wheat crop of 1891-92 submitted to Government on the 1st June 1892.

(7) First forecast of the outturn of wheat during the season 1892-93 submitted on the 3rd February 1893.

(8) *Jute.*—First forecast of the jute crop of 1892 showing the state of the crops up to the end of June 1892, issued on the 30th June 1892.

(9) Final forecast of the jute crop for season 1892 to the 15th August 1892 submitted on the 30th August 1892.

(10) *Oilseeds.*—First forecast of the oilseed crop for the year 1892-93 issued on the 14th February 1893.

(11) Final forecast of the oilseed crop for the year 1891-92 submitted on the 14th June 1892.

(12) *Cotton.*—Report on the cotton crop prepared for the first time by this Department, with reference to letter of the Government of Bengal in the Revenue Department, No. 218Agri., dated 2nd June 1892, and issued on the 20th December 1892.

(13) *Minerals and gems.*—Statistics of the production and value of minerals in each district of Bengal during the calendar year 1892 were compiled from the returns of district officers, and submitted to Government on the 14th March 1893.

(14) *Agricultural implements.*—A list of agricultural implements and machines which have been tested in Bengal during the year ending 30th September 1892, and of those in use which are reported to have met with more or less marked success, was submitted to Government on the 26th November 1892, and published for general information.

(15) *Agricultural statistics for* 1891-92, were prepared during the year in accordance with Bengal Government Resolution No. 1772, dated 4th May 1892, and were submitted after the close of the year to the Board of Revenue.

(16) A list of prices of some important staples in Calcutta, viz., ghi, salted fish, potatoes, mustard oil, cocoanut oil, firewood, bamboos, bricks and lime in January 1891 and January 1892 was prepared and submitted to Government on the 9th June 1892; and a list of prices of the above-mentioned articles obtaining in Calcutta from 1871 to 1892 was revised by this Department, and submitted to Government on the 10th February 1893.

CHAPTER II.

ANALYSIS OF DISTRICTS AND MEASURES OF PROTECTION.

7. *Analysis of Districts.*—Mr. Bhupal Chundra Basu's report on the Nadia district, which was mentioned in paragraph 108 of my last Report, is not yet finished, as other duties prevented him from continuing his enquiries during the year in that district.

Mr. Nagendra Nath Banerjei's report on the Agriculture of the Cuttack district was submitted to the Government of Bengal with this office letter No. 1242Agri., dated 11th May 1893.

8. *Famine relief.*—Under orders of Government No. 574Agri., dated 6th February 1893, the Director has been left out of the chain of correspondence regarding famine relief, in order that he may have more time to devote to the large settlements of revenue and rents which are under his control.

9. *Rent and revenue in precarious tracts.*—No special action has been taken during the year under review, which requires notice under this head. An account of the large settlements of rent and revenue, which were in progress during the year, will be found in the Director's Report on Settlements.

10. *Emigration from Bihar to Burma.*—Mr. Mackay has favoured me with the following information on the subject of emigration from Bihar to Burma during the year—

"The number of emigrants from Bihar to Burma has grown considerably in the course of the past year, nearly all of them coming from the district round Arrah. The movement is becoming more popular, and will doubtless spread.

"The figures for the year are—

Left Calcutta on—		Adults.	Children.	Infants.
30th August 1892	...	89	42	19
20th September 1892	...	34	18	4
19th November 1892	...	58	26	10
18th March 1893	...	6	3	...
26th March 1893	...	4	...	...
		191	89	33

in all 313 souls, as against 77 carried up to March 1892.

"Several men of the first batches of emigrants have been back to their homes for their families and friends, thus doing recruiter's work in its most satisfactory form.

"It has been found by experience that Biharies are not suited to compete successfully with the Madrassi coolies employed in factories, &c., in Rangoon and the towns, but they do better as agriculturists. The men who returned to their friends are all of this latter class, and they speak well of the country and their prospects when questioned.

"The requirements and conditions of the journey and voyage are becoming much better known, and the emigrants now show scarcely any of the fear and hesitation that appeared at first, though there are still occasional desertions at the last moment before sailing.

"We have had no complaints, and the service by steamer has gone smoothly, the people being quite satisfied with the arrangements made for them on board. As will be noticed, they do not travel during the monsoon or hot weather, the main bodies going down between August and January, and there is reason to believe that the number travelling during these months in the present year will be substantially in excess of last year's record."

CHAPTER III.

FOREST, FUEL AND PASTURE RESERVES; ARBORICULTURE; SILK EXPERIMENTS AND ERADICATION OF PEBRINE; LOCUSTS AND INSECTS INJURIOUS TO CROPS.

Forest, Fuel and Pasture Reserves.

11. On page 21 of the Report for the year ending 31st March 1892, it was stated that Mr. Finucane had recommended that a Forest Officer should be deputed to examine the forests owned by private zamindars in the permanently-settled estates in the Burdwan Division, the Sonthal Parganas and Chota Nagpur, and ascertain whether the owners could be induced to adopt measures for their preservation. It was also suggested by Mr. Finucane that the Settlement Officers in Orissa, Chittagong and Jalpaiguri should be instructed to set aside suitable lands for fodder and fuel reserves. With reference to Mr. Finucane's first suggestion, it was decided by Government that no Forest Officer could at present be spared for the enquiry proposed.

In accordance with the second suggestion, instructions were issued, with the approval of Government, to the Settlement Officers of Chittagong and the Western Duars, to place themselves in communication with local forest officers, in order to permit of proposals being made for extensions of forest areas. The Settlement Officer of Chittagong reports that the subject of the establishment of fodder, fuel and pasture reserves has not been lost sight of, but that no action can at present be taken in the direction of reserving particular areas, until it is definitely known what areas are available, *i.e.*, until the areas covered by previous settlements have been assigned to the mahals to which they belong. The Settlement Officer will consider this question further during the next field season; and in the meanwhile he will take care to avoid including in new settlements any areas which are likely to possess any value as reserves. The Commissioner of Chittagong in forwarding the Settlement Officer's report, remarks that in his opinion the subject is not at all pressing, as every part of the district except Kutubdia is within ten miles of the hills, which, being unculturable, may be regarded as natural fuel and pasture reserves; the island of

Kutubdia has a considerable Sunderban area. The Commissioner of Rajshahi has forwarded a report on the subject from the Settlement Officer of the Western Duars, who states that the forest officers of the Jalpaiguri and Buxa Divisions are of opinion that special reserves are not required in the Duars, as the reserved forests are equal to meeting all demands likely to arise. The Settlement Officer remarks that in the Mynaguri Tahsil, long before the settlement operations commenced, cultivation had spread up to the borders of the reserved forests, and that no lands are available in that Tahsil for special fodder reserves. The Commissioner of Orissa forwards a note by the late Mr. H. Reily, Settlement Officer of Orissa, on the subject of setting aside lands for fuel and pasture reserves in the districts of Cuttack, Balasore and Puri, where settlement operations are now in progress. Mr. Reily stated that in the upland laterite tracts of Orissa, where population is sparse and the number of cattle small, forests are being recklessly denuded by indiscriminate cutting and grazing of cattle, but that there is no immediate necessity for establishing reserves in those parts. In the deltaic and highly-populated tract of country near the sea board, the need for fodder and fuel reserves is much greater. The almost total disappearance of grazing grounds in the deltaic area has led to the gradual deterioration of cattle and agriculture. The establishment there of fuel and pasture reserves is highly desirable. The Settlement Officer has, however, no power to force settlement-holders to set aside lands for these purposes. Mr. Reily, however, instructed his Assistant Settlement Officers to make note of any tract of unsettled waste land of more than 10 acres, and to record whether the land is suitable for grazing, whether tenants have rights of grazing over such lands; and whether the needs of the villagers, as regards fuel and fodder, are fully satisfied. The Commissioner, Mr. Toynbee, agreed in the Settlement Officer's remarks and conclusions.

PLANTING AND MAINTENANCE OF TREES IN GOVERNMENT ESTATES AND WARDS' ESTATES.

12. The following particulars are extracted from the local officers' reports on planting and maintenance of trees in Court of Wards' estates and Government estates.

The plantations of teak, mahogany, and other valuable timber and fruit trees in the Sunkurpur estate in the Rajshahi Division are reported to be doing very well. It is proposed to extend the teak plantation during the current year.

A sum of Rs. 66-14-3 was spent for the maintenance of the mahogany, sissoo, and other valuable trees planted in the Jaipur Government estates in Bogra. The trees are reported to be thriving well.

Owing to the dryness of the soil, the plantation of graft trees at Basudebpur in Midnapore has proved a failure, with the exception of a few litchi grafts.

In the Dighapatia estate in Rajshahi the banks of a tank at Bonagaty and the adjacent land belonging to the estate were planted with useful and ornamental trees.

Some trees were planted on Government lands at Falakata in Jalpaiguri.

In the Kujang estate in Cuttack an orchard was planted at Anantpur, and the cocoanut plantation at Kajalpatia and the betelnut plantation at Tikri were kept up during the year. The Collector reports that he found the cocoanut plantation in a neglected state. The Sub-Manager reports that 2,949 of these trees remain barren, although of fruit-bearing age.

Four hundred and one grafts and trees were planted during the year under report in the orchard at Ganja in the Kanika estate in Cuttack. They are reported to be doing well. An expenditure of Rs. 500 during the year under report was sanctioned for the orchard; out of this sum Rs. 469 were expended in fencing, purchasing plants, manure, implements, &c.

During the year under report steps were taken to make a casuarina plantation in the civil station of Puri. In August last, casuarina seeds were planted by the District Engineer, from which 3,000 to 4,000 healthy plants have been obtained. These will be transplanted during the rainy season of 1893.

Grape vines and grafts of apple, plum, pear, peach, and orange trees were supplied to the Superintendent of the Reformatory School at Hazaribagh

in 1888 for experimental cultivation. The grape vines are reported to be flourishing and are bearing fruit. Very few of the apple trees are still alive. One tree is about 12 feet high and bears small inferior fruit, which the Superintendent thinks may improve in time. The plum trees have grown well, but show no signs of blossoming. The other trees are doing well.

13. *Date-palms.*—The Deputy Commissioner of Hazaribagh reports that five date-palms grown from seedlings received from the Director of the Botanical Department, Northern India, Saharanpur, in 1888, are in good condition, their average height now being 4 feet, and the circumference of their stems just above ground level about 11 inches. The 225 Tunisian date-palms grown from seedlings and received from Saharanpur in 1888 are reported to be also in fair condition; their average height is 4 feet and the circumference of their stems just above ground level about ten inches. The Revd. Dr. A. Nottrott of the German Mission, Ranchi, reports that about 93 date-palms grown from seed supplied in 1888 from Saharanpur are doing very well in the Mission compound. The circumference of the biggest palm a little above the ground level is 28 inches. The Subdivisional Officer of Sasaram reports that a large number of seedlings grown from the Egyptian date-palm seed supplied from Saharanpur in 1888 have been planted in the Government garden at Sasaram, Deoria, and Nasriganj, and that they are growing well and are promising. The District Engineer of Patna reports that the result of the cultivation of the same kind of palm has been unsatisfactory. The number of trees in existence at the end of the year in Patna was only 52. The District Engineer does not explain the cause of failure in the cultivation. Some date-palm seed was supplied in 1888 from the Saharanpur gardens to some of the Tributary and Political States of Chota Nagpur. In Gangpur, Sirguja, Jashpur, Seraikela, Kharsawan, Korea, Udaipur and Kuwari a few of the palms grown from the Saharanpur seed are alive, but many of the trees are reported to have been destroyed by whiteants.

14. *Eucalyptus tree.*—The Deputy Commissioner of Hazaribagh reports that all the Eucalyptus trees, about one hundred in number reported to have been alive last year, are in fair condition. The circumference of most of their trunks at heights nine inches and six feet above the ground are two feet four inches and two feet respectively. The average height of the trees is 48 feet.

15. *Divi-divi tree.*—The Deputy Commissioner, Sonthal Parganas, reports that the divi-divi trees planted at Katikund and Jhilimili are doing well.

16. *Reclamation of usar lands by planting trees.*—Mr. Maries, late Superintendent of the Garden of the Maharaja of Darbhanga, having reported some years ago that he had succeeded in reclaiming lands impregnated with saline matter by planting them with trees, especially the Inga saman and abbizzia procera, seedlings of these two kinds of trees were distributed in Bihar in 1887-88, with a view to their being planted on *usar* soil. The reports which have been since received show that the trees have grown well in most of the places where they were planted; but it has not been established that they possess any special virtue in reclaiming saline lands.

EXPERIMENTS IN COMBATING SILK-WORM DISEASE AND REARING HEALTHY SEED.

17. Mr. Nitya Gopal Mukerji, Deputy Collector, continued to be employed on the special duty of rearing and supplying healthy silk-worm eggs to silk-worm rearers in the silk districts of Bengal. The rearing stations of Kalimpong, Pokhuria, and Khulna were kept up during the year, and two new stations were opened at Babukhali in Jessore and Kagachira in Malda. The Revd. Mr. A. Campbell and the Revd. Mr. J. A. Graham undertook the immediate supervision of the work at Pokhuria and Kalimpong. Grants were made to these gentlemen in aid of the experiments which they made in maintaining mulberry nurseries, distributing mulberry plants, and encouraging rearing of cocoons. The Khulna station was managed directly by Mr. Mukerji. The two new stations were worked independently of any pecuniary assistance from Government, only a microscope and some cleaning nets being lent to each station. It appears from Mr. Mukerji's annual report, which is printed as an appendix, that the eggs reared at experimental stations were bought by about one thousand

cocoon-rearers, and that they gave healthy silk-worms in almost every case. The use of the selected seed has become popular chiefly in Malda, where the rearers of one village (Kagachira) have of their own motion combined to follow the approved methods, and one of the rearers has undertaken to use a microscope for selecting seed. Mr. Mukerji states that the second generation of cocoons reared from his seed is also generally used in the silk districts for seed, and that a very large quantity of healthy seed is at present in circulation in the silk districts as a result of his experiments, and that it has resulted in healthier and larger crops of cocoons, and has appreciably affected the produce of silk in Bengal. Mr. Mukerji acknowledges help from Mr. Walton in Rajshahi, Mr. Ferguson in Berhampore, and Mr. Marshall in Birbhum in the matter of the distribution of healthy seed. The expenditure incurred by Mr. Mukerji on the silk-worm rearing experiments during the year was Rs. 7,500. Against this expenditure is to be set a sum of Rs. 974-9 received by sale of seed.

The following report of silk-worm rearing experiments, which have been conducted at Alipur, near Calcutta, by Messrs. J. A. Anderson and R. A. Lyall, has been kindly furnished by the Secretary to the Agri-Horticultural Society :—

"The silk experiments at Alipur, formerly conducted by Mr. Blechynden, have been carried on with fair success up till now. Pebrine appears to be quite eliminated from the stocks both of *desi* and *nistari*, and flacherie also is pretty well a thing of the past; so it may now be hoped that some good seed will be issued from that quarter.

"The usual native plan of feeding the young cocoons only three times a day was abandoned as regards the *desi* worms last bund, following the recommendations lately received from Italy, and which exactly corresponds with those given in ancient Chinese books. The result of feeding at least every two hours, night and day, during the first two months, has been a surprising increase in the size of the worms and the cocoons. Native rearers who have seen them will not believe that they are pure bred *desi*. In the crop of *nistari*, which has just spun, again a considerable number of *nari* worms appeared, notwithstanding the length of time that this variety has been rejected in breeding."

I visited the rearing-houses at Alipur in August 1892, and saw the 13th generation of *nistari* cocoons which had been reared. The cocoons were considered to be very fine. I learnt from Mr. Anderson that *nistari* seed had been sent out from this rearing-house to Gonotea, Midnapore, Bachra, and Berhampore. Flacherie had appeared in two layings, but as the other eggs were particularly successful, it is probable that the loss was due to local causes. In April 1893, cocoons of the 19th generation of the *nistari* breed and of the 9th generation of the *desi* breed were forwarded to me for inspection, which showed great improvement on being compared with the original stocks from which they were derived.

A grant of Rs. 500 was made from the funds of this Department and a donation of Rs. 1,200 was made by Rao Jogendro Narayan Roy of Lalgola in aid of the experiments at Alipur.

Insect Pests.

18. *Locusts.*—Locusts are reported to have visited the following districts, viz., Bhagalpur, the Sonthal Parganas, and Manbhum.

In the Sadar subdivision of the Bhagalpur district a flight of locusts appeared in thana Colgong in May 1892. Coming from a southerly direction, they passed through the country without doing injury to any crops. In the Banka subdivision a swarm of locusts was seen in May 1892 to the north-east of the subdivisional head-quarters. They are believed to have issued from the bed of the Chandan, and not to have come from outside the subdivision. The Collector remarks that it is likely they were hatched from eggs deposited by the swarms which visited the subdivision in 1891-92. They took an easterly flight without doing injury to crops. Sugarcane and paddy seedlings were at the time the only crops on the ground. In the Madhupura subdivision a flight of locusts is reported to have passed from east to west on the 27th June 1892,

doing slight injury to the standing crops in certain villages to the south and south-west of the subdivisional head-quarters.

In the Sonthal Parganas the Sadar subdivision was visited by locusts. The Deputy Commissioner states that the insects made their appearance in May 1892, and passed through the subdivision from east to west. The flight lasted only for an hour or two, but considerable damage is reported to have been done within that time to the indigo crop.

The district of Manbhum was visited thrice by locusts. The first flight appeared in April 1892, and passed from the south towards the north-east without causing any damage, there being no standing crops then. In the following June, swarms appeared on two consecutive days. They passed from the south towards the east of the district, and then turned back towards the south-west, causing slight damage to *dhan* seedlings. In September a third swarm of locusts of a larger kind than those that had visited the district previously travelled from the north and west towards the south-west of the district, and caused some damage to pulse crops.

19. *Other insects injurious to crops.*—From the reports received from Commissioners, it would appear that insect pests did injury to crops in all Divisions of these Provinces, with the exception of Dacca and Rajshahi. Specimens of insect pests which were received during the year from the districts were sent to Mr. E. C. Cotes of the Indian Museum for examination and identification. In the Burdwan Division insects are reported to have appeared at the beginning of the monsoon in the Sadar and Katwa subdivisions of the Burdwan district, and towards the end of the cold weather in the Hooghly district. They also caused some damage to crops in the Sadar subdivision of Midnapore. The districts in the Presidency Division in which insect pests were noticed were Nadia, Khulna, and Murshidabad. In Nadia two kinds of insects, known locally as the *hana* and *dena*, caused some damage to grain and chillies in the Meherpore subdivision. From Khulna it is reported that paddy was damaged by insect pests in the month of Agrahan in parts of the Sadar and Satkhira subdivisions. Specimens of the insects were sent by the Collector to the Indian Museum. The Collector of Murshidabad states that in the Sadar subdivision of his district a considerable area of the Government estates in the Sadar subdivision were affected by insects, and the amount of injury done is estimated at 2,323 maunds of grain. In Jangipur subdivision the wheat crop was attacked by a green coloured insect, about an inch in length, which cut into the roots of early sown wheat, while the gram crop was damaged by a white insect, about half an inch in length, which destroyed the pods of gram. Mr. Nitya Gopal Mukerji observed parasites at Berhampore on edible mushrooms, Indian-corn, and potatoes, and maggots on mango trees, and found a minute insect, belonging to the family of the Coccidae, doing injury to the mulberry crop. Kerosine emulsion was tried as a remedial measure by him for the last-named insect, and was found effective. Red ants did considerable injury to the jail potato crop at Berhampore, and an insect similar to *diatræa saccharalis* damaged tomatoes grown on the jail grounds. In Noakhali slight damage was done to the crops in Sandwip by an insect called "leda." In the Patna Division all the districts, with the exception of Shahabad, were visited by insects. In the Barh subdivision some slight injury was caused to crops during the dull and cloudy weather of February by caterpillars about one-fourth or one-third of an inch in length, which attacked both the flowers and ears of the grain. In Gaya rabi crops, particularly gram, are reported by the Manager of the Tikari ward's estate to have been damaged on low grounds by a kind of black grub. The people ascribed the grub's appearance to the unusual cold and dampness of the season. In Darbhanga the late rabi crops were damaged by a hairy insect about half an inch in length, known locally as *bhua*. In Saran the *sapta* insect is said to have done some damage to the paddy crop in August. In Muzaffarpur and Champaran the indigo crops were attacked after the unusually wet weather in March by minute green caterpillars. The cause assigned for their appearance was the unusual prevalence of east winds at a time when west winds are usual. In Shahabad rabi crops suffered from blight on account of the unusual rain and cloudy skies, which prevailed in February and March 1893. In the Bhagalpur Division insects are reported to have appeared in the Supaul and Godda subdivisions. At Supaul insects appeared in the moist weather in February on some

wheat fields, but did no great injury. At Godda damage was done to *aus* paddy by the Gandhi rice sapper which sucks out the milk from the ear, leaving nothing but husk. Specimens of this insect were forwarded to the Agri-Horticultural Society. It was suggested that fields attacked might be protected by burning vegetable refuse. In Orissa all the districts seem to have suffered from the ravages of insect pests. In Balasore insects locally called *ghoro muha* and *dhala* "punara" caused slight damage to crops. In Cuttack the caterpillar called in the district *pulguna*, and also known as the *katimundi*, *kalimukhi or dhalimukhi* insect destroyed some of the paddy crops, making its appearance after the floods of July 1892, and disappearing after three weeks on heavy rain falling, without doing any very great damage. In Khurda insect pests injured the *mung* and *cheena* crops. In Chota Nagpur slight damage is reported to have been done by caterpillars to paddy and other grain crops in Palamau.

CHAPTER IV.

AGRICULTURAL EXPERIMENTS AND IMPROVEMENTS; AGRICULTURAL IMPLEMENTS; APPLICATIONS FOR PATENTS; AGRICULTURAL EXHIBITIONS; EXPERIMENTS OF THE AGRICULTURAL SOCIETY OF INDIA.

EXPERIMENTAL FARMS.

20. My Assistant, Mr. Nagendranath Banerjei, submits the following report on the Burdwan Experimental Farm:—

Burdwan Farm.

"At the Burdwan Farm experiments were made last year with sugarcane, fodder grasses, jute, paddy, maize, potatoes, wheat, barley, gram and oats. Besides these, winter paddy, brinjals, tobacco, arhar, onions, &c., were grown in the ordinary country method in order to keep the land occupied and get it ready for future experiments.

"(1). *Sugarcane.*—Experiments were made with this crop—

(*a*) To ascertain the comparative merits of different manures applied to the crop.

(*b*) To test the effects of ratooning, *i.e.*, of growing the crops from the previous year's shoots.

(*c*) To compare the method of planting in trenched rows according to the Mauritius system with the ordinary country method of sowing in shallow lines.

"(*a*) Manure experiments with the *samshara* local variety of sugarcane pointed as in previous years to the great value of a mixture of bonemeal and castor-cake when applied as a manure to the crop. The outturn of *gur* obtained by the application of this mixture was 81 maunds per acre, and the net profit per acre after deducting the cost of cultivation, inclusive of cost of manure, was Rs. 105 per acre. Castor-cake by itself gave an outturn of 79½ maunds, and a mixture of bonemeal, super and saltpetre, yielded 60 maunds per acre. In these two cases the net profit after deducting cost of cultivation, including purchase of manures, was Rs. 78 and Rs. 54 per acre respectively. It is not possible to determine the increase in the outturn due to the application of the manures, as the plot which was left unmanured failed to germinate; but taking the results of previous years into consideration, it may be safely asserted that had the unmanured plot yielded any outturn, a comparison with this outturn would have shown that the extra money laid out in the purchase of the manures was more than covered by the increase in the outturn due to their application. The other manures used came in the following order of merit:—bonemeal and saltpetre (mixed together), bonemeal, super, gypsum and saltpetre (mixed together), cow-dung, and super and castor-cake (mixed together). The details of outturn, of the cost of cultivation, and of the profi- per acre will be found in statement (*a*) of Appendix B.

"(*b*) *Ratooning experiments.*—The ratooning experiments of previous years having shown that the practice of growing canes from old shoots was more

suitable to thick-skinned varieties like the *khari* than to thin-skinned varieties like the local *shamshara* canes, the former alone were grown last year according to this system. The result of the experiment on plot 38, which was planted with *khari* cuttings in 1887-88, will be first described. Year after year since 1887-88, *khari* sugarcane has been grown on this plot from the original stools, which have not been removed from the land. The manure used every year has been cow-dung, which has been applied at the rate of 300 maunds per acre. The results obtained last year and in previous years are given in the following statement:—

1	2	3	4	5
Years.	Outturn of *gur* per acre.	Total cost of cultivation per acre, inclusive of manure.	Money value of outturn per acre.	Net gain or loss per acre after deducting total cost of cultivation.
	Mds. S. CH.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1887-88	69 24 0	213 0 0	208 8 0	—(4 8 0)
1888-89	86 16 0	152 4 0	345 0 0	+(192 12 0)
1889-90	95 8 8	150 0 0	476 1 0	+(326 1 0)
1890-91	125 4 0	189 0 0	625 8 0	+(436 8 0)
1891-92	98 4 0	144 0 0	634 8 0	+(490 8 0)
1892-93	95 4 0	129 0 0	478 8 0	+(349 8 0)

"In the year 1891-92, the outturn of *gur* is shown in the above statement to be lower than that of the previous year, but had not a portion of the crop been reserved by a mistake of the overseer in charge of the farm for cuttings, the outturn of *gur* would most probably have been more than that of the previous year. The price of cuttings is included in the 4th and 5th columns of 1891-92, hence it is that the money value and net gain show an increase over the figures given in these columns against the year 1890-91. It will be seen from the figures in the second column that the outturn increased annually up to the fourth year of harvesting. There was a decrease last year, and it now remains to be seen whether the crop has really begun to deteriorate. With the exception of the year 1890-91, when extra expenditure had to be incurred for the harvesting of a bumper crop, and for the manufacture consequently of a large amount of *gur*, the cost of cultivation has gradually decreased each year, due to a saving of the cost of planting as well as of several ploughings. Plots 14 and 15 of the farm were also under ratooned canes. The outturn of these plots last year (*i.e.*, in the fourth year of harvesting) was less than that of the previous years—a result which may be attributed either to the unseasonableness of the year, or to the loss of power in the crop after four years of growth from the same stools. The results of a few years more would throw light on the latter point. The figures of outturn and profit given below, which show results obtained since 1889-90, however, tend to point to the profitableness of ratooning:—

Years.	Number of plots.	Outturn of *gur* per acre.	Net gain per acre, after deducting cost of cultivation.
		Mds. S. C.	Rs. A. P.
1889-90 ...	Plot 14	36 0 0	40 11 0
	,, 15	44 16 0	57 15 0
1890-91 ...	,, 14	63 38 4	194 8 6
	,, 15	68 10 0	205 2 0
1891-92 ...	,, 14	63 3 0	286 14 0
	,, 15	69 0 0	285 3 0
1892-93 ...	,, 14	54 0 0	122 0 3
	,, 15	60 0 0	125 13 0

"The great difference in the net profit per acre between the first year of planting and the subsequent years of ratooning is due not only to the increase in the outturn of *gur*, but also to the decrease in the cost of cultivation, resulting from a saving of the cost of planting and the cost of several ploughings which are not necessary when the sugarcane plants are ratooned.

"The success of ratooning having been brought to the notice of neighbouring cultivators, two of them took *khari* cuttings from the farm in the year 1891-92, with the object of growing ratoon crops. The Overseer in charge of the farm reports that the results obtained by them last year, *i.e.*, in the first year of ratooning, were better than those obtained by them in the previous year from fresh planted cuttings. Besides the above, some eleven raiyats were supplied with *khari* cuttings last winter, all of whom propose ratooning their crops.

"(*c*). In the neighbourhood of the Burdwan farm, the method adopted by the cultivators of planting canes is to sow them in shallow irregular furrows. The Mauritius system of planting in deep trenches being recommended by sugar growers, experiments were started on the farm in the year 1890-91, and have been continued since with the object of comparing the two methods. The results obtained last year, as in the previous two years, point to the superiority of the latter system of planting. In one series of two plots, the outturn last year of *gur* per acre obtained from planting in shallow furrows was only 12 maunds per acre, while that obtained by planting in trenches was 21 maunds per acre. In these two plots the crop suffered very much from want of rain, and gave a poor outturn, but still the experiment pointed to the superiority of trench planting. The extra expenditure incurred in trench planting was Rs. 9 per acre, and the money value of the increase in the outturn was Rs. 27 per acre. In a second series of two plots, the outturns of *gur* obtained from trench planting and shallow sowing were 65 maunds 25 seers per acre, and 31 maunds 20 seers per acre respectively. An extra outlay of Rs. 35 per acre in trench planting in this second experiment led to an increase in outturn, valued at Rs. 153 per acre.

"(2) *Fodder grasses.*—The fodder grasses grown on the Burdwan farm during the year were *Sorghum saccharatum*, *Reana luxurians* and *Sorghum vulgare* (white *cholum*). *Sorghum saccharatum* was manured with bonemeal in order to compare its outturn with that of an unmanured plot. An outlay of Rs. 5-10 per acre on account of the application of the manure led to an increase in the outturn estimated at Rs. 18-12 per acre, so that an increase in the net profit was obtained by its use of Rs. 13-2 per acre. This result confirmed the experience of previous years that bonemeal proves a profitable manure for this fodder grass. The gross cost of cultivation, however, last year was much higher than that of the previous year (two annas against two pice per maund)—a result due to the larger number of ploughings and weedings given last year on account of the bad condition of the land on which the crops were grown. The grass was given to the cattle of the farm, which ate it with great relish.

"(3) *Jute.*—The experiment with this crop, as in previous years, was designed to test the comparative merits of different manures. The results of the experiment confirmed the experience of previous years that cowdung proves a better manure for this fibre crop than a mixture of super and saltpetre, and better also than castor-cake or bonemeal. After cowdung, super and saltpetre mixed together gave the best results. Next in order of merit came castor-cake and then bonemeal. In each case the cost of the manures was covered by the heavy outturn due to their application. The quality and colour of the fibre produced have been much appreciated by all who have seen the jute. The length of the stalks varied from 12 to 16 feet, while the average length of the fibre itself was about 11 to 12 feet, comparing very favourably with the usual length of the fibre grown in some parts of the Burdwan Division, which seldom exceeds eight or nine feet. The results of outturn, cost of cultivation, and profit will be found in statement (*e*) of Appendix B.

"(4) *Paddy.*—The object of the experiments with paddy was to test the comparative merits of (*a*) different kinds of manures applied to autumn paddy, (*b*) of different kinds of manures applied to winter paddy, and (*c*) of fine and coarse paddy.

"(*a*) *Aus or autumn paddy.*—The manures applied to this crop were cowdung, bonemeal, and saltpetre. The seed was sown in June and seedlings transplanted in the month of July. The treatment of all the plots in which

the seedlings were sown, with the exception of the special manurial treatment to which each plot was subjected, was exactly the same. The crops of these plots were harvested in the month of October after having occupied the land for a period of three months and 25 days. Cowdung and bonemeal were applied at the time of ploughing the land, while saltpetre was given only as a top dressing when the plants had attained a height of 10 to 12 inches. The results of the experiment, so far as they disclosed the relative merits of the manures applied, were similar to those of the previous year, inasmuch as bonemeal yielded the largest outturn of grain, followed by saltpetre, while cowdung came third with the unmanured plots yielding least. The application of three maunds of bonemeal per acre, valued at Rs. 5-10 per acre (this being the cost of the meal as manufactured on the Farm), together with an extra cost of annas 12-6 incurred on account of the application of the manure, gave an increase over the unmanured plots of 12 maunds of grain and 15 maunds 24 seers of straw per acre, valued at Rs. 27-10-9. Saltpetre, which was applied at the rate of 30 seers per acre, and at a cost of Rs. 4-0-6 per acre, yielded an increase over the unmanured plots of 10 maunds 27 seers of grain and 16 maunds 7 seers of straw per acre, valued at Rs. 25-13-9. Cowdung, which was applied at the rate of 150 maunds per acre and at a cost of Rs. 7-11 per acre, gave an increase in the outturn of 5 maunds 26 seers of grain and 11 maunds 19 seers of straw per acre, valued at Rs. 15-4-3. The average outturn of grain of the aus paddy plots this year amounted to 27 maunds 2 seers per acre, yielding an increase of 11 maunds 37 seers per acre over the average outturn of *aus* paddy as produced on the Farm last year. Much *aus* paddy is not grown in the neighbourhood of the Farm, which being low-lying is chiefly cultivated with winter paddy, but from enquiries made among those who have *aus* paddy lands, the average yield this year of the raiyats near the Farm may be estimated at 6 to 8 maunds per bigha, or about 21 maunds per acre.

(*b*) *Aman or winter paddy.*—Experimental *aman* paddy this year on the Farm has been very successful. The best plot on the Farm yielded 55½ maunds of grain, and 61 maunds 35 seers of straw per acre, a result obtained by the application of 3 maunds of bonemeal and 30 seers of saltpetre, costing Rs. 9-6 per acre. After deducting the cost of manure and of cultivation, the nett profit per acre in the plot amounted to Rs. 99-10-3. This bumper outturn compares very favourably with the largest yield obtained by the raiyats in the neighbourhood, who do not think that any of their fields has produced more than 10 to 12 maunds per bigha, *i.e.*, 30 to 32 maunds per acre. The highest outturn last year, being the first year in which *aman* paddy was experimentally treated, amounted to 54 maunds of grain and 67 maunds 20 seers of straw, and this result was obtained in the same bonemeal and saltpetre plot which yielded the bumper crop this year. These results of two successive years point to the great value of bonemeal and saltpetre when used together as a manure for paddy, the extra outlay in the purchase of the manures being more than recouped by the increase in the outturn. This year the outlay for bonemeal and saltpetre, together with the extra cost incurred on account of their application, amounted to Rs. 11-1-2 per acre. This yielded an increase in the outturn of 39 maunds 15 seers of grain and 38 maunds 18 seers of straw, valued at Rs. 89-12 per acre.

"Besides bonemeal and saltpetre mixed together, the following manures were used for winter paddy:—bonemeal alone, castor-cake alone, and cowdung alone, the object being to compare the relative merits of these manures, and to ascertain the increase due to their application over those plots which received no manure. As compared with the unmanured plots, bonemeal applied at an extra cost of Rs. 6-12-8 per acre yielded an increase in the outturn, valued at Rs. 68-6 per acre. Cowdung, involving an extra cost of Rs. 10-3-11 per acre, yielded an increase in the outturn valued at Rs. 15-10-6 per acre, and castor-cake applied at an extra cost of Rs. 12-9-11 per acre yielded an increase in the outturn, valued at Rs. 59-15 per acre.

"(*c*) *Fine and coarse paddy.*—In the year 1891-92 seedlings of a fine variety of paddy yielding what is commonly known as table-rice in Calcutta were brought from Diamond Harbour and transplanted on the Farm in order to compare their outturn, and the money value of the outturn with that of the local

coarse paddy ordinarily grown by raiyats in the neighbourhood of the Farm. It was found that although the yield of grain of the fine paddy was about 10 maunds less per acre than that of the coarse paddy, this was compensated for to a great extent by the higher price the former variety fetched in the market. Seed of this fine variety was stored in the Farm and sown during the year under report, to compare the outturn obtained from it with coarse paddy and with fine paddy raised from fresh fine paddy seed imported also from Diamond Harbour. No manure whatever was used. It was found that the stored fine paddy seed of 1891-92 yielded an outturn of 18 maunds of grain per acre, and a net profit per acre after deducting the total cost of cultivation of Rs. 40. Coarse paddy yielded a larger outturn, viz., 24 maunds of grain per acre, but the net profit, Rs. 38 per acre, was less than that of the fine paddy obtained from the seed of 1891-92. These results like those obtained from the experiment of 1891-92 tend to show that fine paddy, if carefully grown, is likely to give as good, if not better, financial results than coarse paddy, although in the matter of yield it may show itself inferior. The fine paddy seed imported this year from Diamond Harbour did not give very satisfactory results. The yield per acre was only 16 maunds, and the net profit per acre Rs. 36. This year being only the second year of this experiment, it must be continued for a few more years, before any definite conclusions can be drawn regarding the relative merits of fine and coarse paddy.

"Besides the above experiments with *aus* and *aman* paddy, several unmanured plots were sown with the latter kind of paddy to keep the land occupied, with a view to prepare it for future experiments, the plan being to reduce the plots by such cropping as far as possible to a common level of fertility before beginning to experiment on them. It has the additional advantage of the growth of high jungle with which the plots would otherwise be covered, and it also adds to the income of the Farm. The average outturn of grain of these plots as reported by the Overseer in charge amounted to nearly 25 maunds per acre.

"(5) *Maize.*—Experiments with this crop were made with a view (*a*) to test the manurial value of bonemeal, (*b*) to compare the merits of different varieties of maize. The latter experiment totally failed, owing to the crops having been attacked by insect-borers at the commencement of their growth. The plan recommended by the Museum authorities of removing all dry leaves failed to drive away the insects, which completely damaged the crops. The experiment on the bonemeal plot was only partially successful, as both it and its contrasted unmanured plots were also attacked by the same pest; but the experiment as it stood showed that by an application of bonemeal at the rate of 6 maunds, valued at Rs. 11-4 per acre, an increase was obtained over the unmanured plot of 7½ maunds of grain and 66 maunds of stalk, valued at Rs. 15 per acre. The net profit of the bonemeal plot, however, only amounted to 15 annas per acre, while in the unmanured plot there was a loss of Rs. 2-13 per acre.

"(6) *Potatoes.*—Experiments with the potato crop were made—(*a*) to ascertain the relative merits of different kinds of manures on Naini Tal potatoes; (*b*) to ascertain the comparative merits of the Cheera Punji and Nani Tal potatoes.

"(*a*) It was reported last year that the outturns obtained in the Farm were higher than those of any previous year. This year's record is still higher. The largest outturn this year was 252 maunds per acre obtained by an application of a mixture of cowdung and castor-cake against 240 maunds per acre of last year obtained by the application of the same manures. Two hundred and thirty-four maunds per acre were obtained by the use of castor-cake alone, and 216 maunds by the application of cowdung and bonemeal. Bonemeal by itself yielded 195 maunds per acre, and cowdung alone yielded 192 maunds per acre. These results, which are in accordance with those of last year, point to the great value of mixing cowdung with castor-cake or bonemeal as a manure for potatoes, the mixture in each case having yielded better results than the manures used alone. The outturn of the unmanured plot with which the above were compared was only 75 maunds per acre. In the subjoined

tables will be found the net profits per acre, due to the use of these single and combined manures, as compared with no manure:—

STATEMENT I.

Particulars.	Yield per acre. 1892-93. Mds.	s.	ch.
Cowdung ... ... 600 maunds per acre Castor-cake ... ... 18 " " "	252	0	0
Cowdung ... ... 1,200 " " "	192	0	0
Castor-cake ... ... 36 " " "	234	0	0
Unmanured	75	0	0
Increase due to application of cowdung and castor-cake ...	177	0	0
Increase due to cowdung	117	0	0
Ditto castor-cake	159	0	0
	Rs.	a.	p.
Value of increase due to application of cowdung and castor-cake	341	4	0
Value of increase due to cowdung	204	12	0
Ditto ditto castor-cake	278	4	0
Increase in cost of cultivation due to cowdung and castor-cake	52	10	0
Increase in cost of cultivation due to cowdung ...	48	0	0
Increase in cost of cultivation due to castor-cake ...	52	0	0
Net increase in profit due to the application of cowdung and castor-cake	288	10	0
Net increase in profit due to the application of cowdung ...	156	12	0
Net increase in profit due to the application of castor-cake	226	4	0

STATEMENT II.

Particulars.	Yield per acre. 1892-93. Mds.	s.	ch.
Cowdung ... ... 600 maunds per acre Bonemeal ... ... 6 " " "	216	0	0
Cowdung ... ... 1,200 " " "	192	0	0
Bonemeal ... ... 12 " " "	195	0	0
Unmanured	75	0	0
Increase due to the application of bonemeal and cowdung...	141	0	0
Increase due to the application of cowdung ...	117	0	0
Increase due to the application of bonemeal ...	120	0	0
	Rs.	a.	p.
Value of increase due to application of cowdung and bonemeal	246	12	0
Value of increase due to application of cowdung ...	204	12	0
Value of increase due to application of bonemeal ...	210	0	0
Increase in cost of cultivation due to cowdung and bonemeal	35	4	0
Increase in cost of cultivation due to cowdung ...	48	0	0
Increase in cost of cultivation due to bonemeal ...	21	0	0
Net increase in profit due to the application of cowdung and bonemeal	211	8	0
Net increase in profit due to the application of cowdung ...	156	12	0
Net increase in profit due to the application of bonemeal ...	189	0	0

"A second series of three plots manured respectively with castor-cake, bonemeal, and cowdung proved the first to be the best manure for the potato crop in point of outturn. The results are given in detail in statement (*j*) of Appendix B.

"(*b*) The variety experiment pointed to the superiority of Naini Tal over Cheera Punji potatoes. While the latter suffered badly from the rain which fell in February and March, and yielded only 90 maunds per acre, the former yielded in one plot 204 maunds per acre, and in a second plot 150 maunds per acre. All these three plots were manured with a mixture of

cowdung, ashes, bonemeal and castor-cake, the largest outturn obtained by which application last year was 199 maunds 39 seers per acre against 204 maunds per acre of this year as mentioned above. The money value of the outturn and the net profit in each case are given in statement (*k*) in Appendix B.

"(7) *Wheat, barley, gram, and oats.*—Wheat barley, gram, and oats were destroyed on account of the unusually abnormal weather which prevailed during the last *rabi* season. The seed could not be sown till five weeks later than the proper time, and the result was that the plants after germinating did not thrive at all, and were only fit to be eaten off by cattle.

"(8) *Expenditure and receipts:*—Statement (*l*) in Appendix B gives the details of expenditure and receipts of the Farm for the year 1892-93. The gross expenditure of the Farm during the year under report was Rs. 1,864-5-9, against Rs. 1,565-14-4 of the preceding year, the increase being due to the addition of new land to the Farm, which had to be broken and levelled. The receipts of the Farm from the sale of agricultural produce, which amounted to Rs. 1,167-7, compare favourably with that of the preceding year and of the previous years which were Rs. 229-10-3 for 1888-89, Rs. 456-6-3 for 1889-90, Rs. 808-1-7 for 1890-91, and Rs. 1,162-3 for 1891-92. The actual cost of cultivation amounted to Rs. 1,193-6, exceeding the realization of the Farm by Rs. 25-15 only.

"(9) The lessons which have been taught by the experiments conducted in the Farm since its establishment may be thus briefly summarised:—

(*a*) A mixture of bonemeal and saltpetre proves a profitable manure for the winter paddy crop.

(*b*) A mixture of castor-cake and bonemeal forms an excellent manure for sugarcane, and generally gives a larger outturn than either of these manures used singly.

(*c*) Planting sugarcane in regular parallel trenches after the Mauritius system is more profitable than the method adopted generally by the raiyats in the neighbourhood of the Farm of sowing in shallow irregular furrows.

(*d*) Certain varieties of sugarcane (*e.g.*, the *khari* variety) may be grown (ratooned) with profitable results year after year for several years from the previous year's stools.

(*e*) Potato seed imported from hill stations, *e.g.*, Nani Tal, gives a much heavier outturn, and outturn of a better quality, than that obtained from seed of country varieties. The imported tubers are also hardier and can better resist the effects of drought and inundation.

(*f*) Mixtures of cowdung and castor-cake and of cowdung and bonemeal prove profitable when applied to the potato crop, and yield better results than either of these manures used singly.

(*g*) High cultivation and liberal manuring prove profitable with the potato crop.

(*h*) Grasses, such as *Sorghum saccharatum*, *Sorghum vulgare* and *Reana luxurians*, can be cultivated without much trouble, and profitably as fodder for cattle: the outturn of *Sorghum saccharatum* can be profitably increased by the application of bonemeal.

(*i*) The *khari* coloured variety of cotton, known as Nankin cotton, yields better results than some American varieties.

(*k*) Cowdung proves a better manure for jute than such manures as castor-cake, super and saltpetre.

(*l*) A soil-inverting plough like the Sibpur plough is superior to the country plough for breaking up new land. The latter acts very well when following the former, as it does the work of a grubber, breaking up the clods, which are apt to form from the furrow slices turned by the soil-inverting action of the Sibpur plough.

(*m*) Grasses growing rank, and becoming uneatable by cattle, may be usefully converted into palatable fodder as silage.

"The above conclusions have been drawn from results of experiments which have been described in detail in a separate pamphlet."

21. My Assistant, Mr. Bhupal Chandra Basu, submits the following report on the Dumraon Farms:—

"(1) The following is a combined report on the working of the two Experimental Farms at Dumraon and Bhojpur and of the Model Farm which was established near Dumraon in 1891:—

Dumraon and Bhojpur Experimental Farms.

"(2) The crops experimented with during the year were winter paddy, sugarcane and wheat in the Dumraon Farm, and potatoes in the Bhojpur Farm. Besides, a large portion of the Farms was cropped with non-experimental crops, such as wheat, *khesari* and maize.

"(3) *Winter paddy.*—The experiments with this crop were designed, as in previous years, to test the comparative merits (*a*) of different manures applied to it, and (*b*) of the *soil-inverting* against the country plough. But unfortunately the crops which were very promising in the beginning were totally destroyed by drought in October and November. At the same time, owing to an unfortunate misunderstanding between the Overseer and the local canal subordinates, no water could be had from the Bhojpur distributary, from which the Farm had hitherto derived its water-supply.

"(4) *Sugarcane.*—As usual, the experiments with this crop were designed to test the comparative merits (*a*) of different manures, and (*b*) of the Mauritius system of trench-planting against the local method of planting behind the plough.

"Eight plots, each measuring 400 square yards, were treated with different manures. These were crude saltpetre applied at the rate of 3 maunds per acre, household ashes—the ordinary manure used for sugarcane—at 240 maunds per acre, linseed cake at 6 maunds per acre, and bone-ashes at 3 maunds 25 seers per acre. None of the 8 plots had received any manure in previous years, but they had been differently treated in respect of cropping and irrigation. It is therefore probable that the 8 plots when placed under experiment were not quite equal in respect of their initial fertility. This condition, indispensable to accurate experiment, is very difficult to ensure without a chemical and mechanical analysis of the soil, the more so in a small farm like ours, where almost all the plots have been at some time or other placed under experiment, and consequently received a different treatment from its neighbours. The outturns of the plots obtained during the year were, however, marked by such wide variations, due no doubt mainly to the influence of the different manures, as to justify the conclusions stated below. Statement (*a*) in Appendix C shows the treatment and results of the eight plots under experiment. The results have fully borne out our previous experience of the great manurial value of saltpetre for sugarcane. It will be seen that this manure used alone enhanced the yield from 27 maunds 21 seers—the average outturn of the two unmanured plots—to 61 maunds 28 seers per acre, and gave a nett increase in profit amounting to Rs. 84-9-7½ per acre. Ashes gave as usual a larger outturn than 'no manure,' and when combined with saltpetre, a still larger outturn than the latter; but it is rather curious that the combination of ashes and saltpetre gave a smaller outturn than saltpetre used singly (51 maunds 17 seers against 61 maunds 28 seers). A similar anomaly was observed in 1891-92 and noticed in the Annual Report of the Department for that year (*vide* page 29).

"The use of bone-ashes applied at the rate of 3 maunds 25 seers per acre, and costing Re. 1-4 per maund, resulted in an increase in the outturn of 22 maunds 15 seers, and in an increase in the nett profit, amounting to Rs. 58-7-2 per acre, over the outturn and nett profit of the unmanured plots. If the promising character of this manure be sustained by future experience, it will have been shown that raw bones can be easily converted into a useful manure by being merely burnt.

"Statement (*b*) shows the results of the experiment in the Mauritius system of planting as contrasted with the method in vogue in Bihar. As in previous years, the Mauritius system gave a larger outturn than the local; the increase in outturn obtained last year and in 1891-92 from the Mauritius method of planting was, however, not so large as in previous years. The Burdwan system of

planting on raised beds three feet wide was also tried, but did not prove superior to the local method.

"(5) *Wheat.*—The experiments in wheat were designed, as in the previous years, to test the comparative merits (*a*) of the soil-inverting and the country plough, (*b*) of different manures applied to this crop, and (*c*) of saltpetre with or without irrigation. The results are tabulated in statements (*c*), (*d*) and (*e*) in Appendix C.

Of the two plots differently ploughed, one was ploughed only once by the soil-inverting plough and three times by the country plough, and the second was ploughed four times by the country plough. The soil-inverting plough is found to go slightly deeper into the soil than the country plough. From statement (*c*) it will appear that the plot ploughed up with the soil-inverting plough gave 2 maunds 10 seers of wheat and a nett profit of Rs. 6-6 over and above the outturn and nett profit of the plot on which the country plough had been used. The result only confirms the experience of previous years.

The manure experiments with wheat were made on five plots, Nos. 13, 14, 15, 16 and 17. The last season was not altogether favourable to the cultivation of wheat, and the outturn was in consequence poor. Besides, a species of grasshopper (*katui*) did considerable damage to the crops in young life. The five plots were unequally affected, plots Nos. 13 and 14 having been injured most of all. The figures of outturn given in statement (*d*) cannot, therefore, be accepted as correctly representing the effects of the different manures with which the plots had been treated. The results are, however, given for what they are worth; it will appear that in spite of the unequal incidence of injury by the insects, the results afford evidence of the beneficial effects of ashes, saltpetre and linseed cake.

The experiment with wheat dressed with saltpetre with or without irrigation fully bears out the result of the previous year, namely, that in the absence of irrigation, saltpetre remains inert in the soil and shows no effect. Thus while saltpetre with irrigation gave an outturn of 12 maunds 28 seers and a nett profit of Rs. 9-7 per acre, saltpetre without irrigation gave only an outturn of 6 maunds 26 seers, and resulted in a nett loss of Rs. 7-11-3 per acre. *Vide* statement (*e*).

"(6) *Potatoes*—Only one kind of experiment was made during the year with this crop. It was intended to test the value of green manure and of bonemeal used singly and in combination for the potato crop. The experiment was made in the same series of plots and on the same plan as in 1891-92. The results are given in statement (*f*) in Appendix C. They amply confirm the experince of the previous two years as to the very profitable character of green manuring for potatoes. The potato crop was comparatively poor last year, hence with the exception of two plots which left a small nett profit, the others resulted in loss. The comparative effects of the manures will, however, clearly appear from columns 9 and 10 of the statement. It will be seen that one of the two plots (No. 3) manured with a green crop gave a nett increase in outturn, amounting to 37 maunds 33 seers, and a nett increase in profit, amounting to Rs. 16-2-2 over the outturn and profit of the unmanured plot (No. 4). The corresponding increases in outturn and profit from the other green manured plot (No. 5) were 34 maunds 32 seers and Rs. 13-13-5 respectively.

Plot No. 2, which was manured with bonemeal, gave, as compared with the unmanured plot No. 4, an increase in outturn of 51 maunds 17 seers of potatoes, and a nett increase in profit of Rs. 31-11 per acre. In 1891-92 the increases in outturn and profit from the application of bonemeal were 25 maunds 5 seers and Rs. 15-10-6 respectively. Again, the addition of bonemeal to hemp was found to increase the outturn by 12 maunds 16 seers in 1891-92 and by 33 maunds 11 seers in the year under report. Taking these facts together, it will appear that the increases in outturn due to the application of bonemeal were larger in 1892-93 than in 1891-92, due very probably to the combined influence of the residue of the bonemeal applied in 1891-92, and the bonemeal applied in the following year. The fact would appear to furnish evidence of the slow but enduring action of bonemeal as a manure. I have gathered additional evidence of the fact from the results of another series of plots in the Bhojpur Farm, which had been manured with bonemeal and other manures for potatoes in 1890-91, and since then have borne two maize

crops in 1891 and 1892, a potato crop in 1891-92, and a wheat crop in 1892-93. I show the results in an abstract form below :—

Statement showing increases of outturn due solely to bonemeal.

		Potatoes.	Maize.	Potatoes.	Maize.	Wheat.
		1890-91.	1891.	1891-92.	1892.	1892-93.
Plot 6.	Bonemeal 6 mds.	... 108-36	12-4	96-32	17-22	15-5
	over					
Plot 7.	No manure	... 62-24	16-1	48-16	9-3	10-11
	Increase	... 46-12	—3-37	48-16	8-19	4-34
Plot 10.	Hemp & bonemeal	... 150-1	9-3	87-29	13-12	19-14
	over					
Plot 9.	Hemp alone	... 140-26	8-18	62-0	12-4	12-4
	Increase	... 9-25	0-25	25-29	1-8	7-10

"It will be seen that with the exception of one crop, namely, maize of 1891, which was considerably damaged by whiteants, the bonemeal-manured plots have continued since 1890-91 to show an increase in outturn. The soil of the Bhojpur Farm is an open loam ; and it is very probable that on this kind of soil the use of bonemeal will be found profitable. On the stiff clay soil of the Dumraon Farm, bonemeal has invariably failed to show any increase in outturn either in the year of its application or in following years.

"Will it pay to grow hemp or other green crop for manure in the rainy season in place of maize or other bhadoi grains which return a direct profit ? The results obtained from the experiments of 1891-92 showed that it did pay to grow hemp instead of maize, a nett increase in profit of Rs. 37-0-10 having resulted from the plot treated with hemp over that of the plot which bore maize in the rains and potatoes in the cold weather. The result of the experiment of 1892-93 likewise shows a nett increase in profit in favour of hemp. This is obtained by deducting the nett profit returned by the maize and potato crops of one of the two plots from the nett profit returned by the potato crop of the other, and is found to be Rs. 3-12-3 per acre.

"(7) *Receipts and expenditure of the Experimental Farms and the Economic Museum.*—These are shown in statement (*g*) in Appendix C. The total cost amounted to Rs. 1,856-5-11, against Rs. 1,896-13-2 in the preceding year, and the total receipts amounted to Rs. 486-15-5 against Rs. 717-4-3 in 1891-92. The actual cost properly debited to cultivation came up during the year to Rs. 483-8 against Rs. 614-3-11 in the previous year ; the decrease in the expenditure was due to a smaller area having been cultivated with sugarcane and potato than in 1891-92. This fact, as well as the total failure of the paddy crop, also account for the diminished earnings of the Farms, which were, however, just sufficient to cover the actual cost of cultivation. During the year the Farm premises which had fallen out of repairs, and did not give sufficient accommodation for the farm servants, cattle and stores, were repaired and enlarged at a cost of Rs. 264-8-3, which has been included in the total cost shown above. The nett cost of maintenance of the Experimental Farms and the Museum amounted to Rs. 1,369-6-6 against Rs. 1,579-8-11 in 1891-92.

"(8) During the year under report an agricultural exhibition was held at Dumraon under the auspices of the Maharaja of Dumraon and the Collector of the district, Mr. F. H. Skrine. Mr. Banerjei and myself submitted a joint note on the show. It will be out of place for me to notice the show here in detail. With a view to bring the results of the Dumraon and Bhojpur Farms to the notice of the visitors to the show, the results of the Farms since their creation in 1885 were reviewed by me in a small pamphlet, copies of which and of its Hindi version prepared by order of Rai Jai Prakas Lal Bahadur, C.I.E., were freely distributed among the visitors.

"(9) I believe it is the proper thing to briefly notice here the important results brought out by the Dumraon and Bhojpur Farms. These were summed up in the pamphet above mentioned as follows :—

(1) that a plough which inverts the soil gives a larger outturn of wheat and paddy, the only crops on which it has been tried, than the country plough, which breaks the soil but does not invert it ;

(2) that for irrigated wheat and sugarcane, crude saltpetre is an excellent and profitable manure;

(3) that the outturn and quality of wheat may be improved by introducing better varieties of wheat than those locally grown;

(4) that it is more profitable to plant sugarcane in straight and parallel trenches, as is done in Mauritius and other sugarcane-growing countries, than in irregular plough furrows, as is done in Bihar;

(5) that certain varieties of potatoes, of which the seed can be imported from the Naini Tal hills, give a larger outturn and of better quality than the country varieties; and

(6) that ploughing in a green crop of hemp (*sanai*) is an excellent and profitable manure for potatoes and also for wheat.

It will be seen that the results of the experimental operations of 1892-93, which could not be noticed in the pamphlet, have furnished further corroborative evidence of the superiority of the soil-inverting to the country plough, of the value of hemp and saltpetre, and of the superiority of the Mauritius system of planting to the local method.

Dumraon Model Farm.

"(10) The Model Farm has just completed its second year of existence. The results of cultivation during the first year (1891-92) were briefly reported in the Annual Report of the Department for that year (*vide* page 30). The Farm has a total area of 27 acres 3 roods 24 poles, out of which 26 acres 2 roods and 23 poles are actually under cultivation, the rest being occupied by roads and boundaries, &c. The soil of the Farm is a stiff clay unsuited to *bhadoi* cultivation. Winter paddy cannot also be grown without incurring risk of failure in the event of drought during October and November. The land is, therefore, suited to the cultivation of only *rabi* crops and sugarcane.

"During the year the construction of the well which had been commenced in the previous year was completed at a total cost of Rs. 1,397-9-6. The well is capable of working four *motes* at a time, and it is expected that with a few improvements it will be able to supply water for eight *motes*, *i.e.*, for nearly one acre of land a day.

"The crops grown on the Farm were wheat, gram, barley, *khesari* and linseed. Their outturn and the treatment which they received are shown in detail in statement (*h*) in Appendix C. Thorough tillage and the use of saltpetre and bone-ashes were the measures by which we aimed to obtain good results. The *rabi* season of 1892-93 proved in many ways unfavourable to cultivation; and in consequence the rabi crops of the district turned out considerably below the average. So far as want of moisture in the beginning of the season was concerned, it was considerably mitigated by careful and thorough tillage, and in a few plots by irrigation from the well. But the abnormally heavy rains of February and March proved exceedingly injurious, particularly to the two plots of wheat manured with saltpetre. The crop on these two plots was, to begin with, the most promising in the whole Farm, but the tendency of the manure to retard the ripening of the crop made it specially susceptible to rust. Much of the injury was due to the fact that the well could not be completed until the 9th December, and consequently the application of saltpetre had to be deferred till then. An early application of the manure would have been in all probability quite safe.

"On the whole, the financial results of the Model Farm, which supply the only test of its success, were not so discouraging as the unfvaourable character of the season would lead one to expect. The receipts and disbursements of the Farm are shown in detail in statement (*i*) in Appendix C. It will be seen that after deducting all items of expenditure, interest on capital outlay and depreciation of stock, the farm left a nett profit of Rs. 114-12-9 against Rs. 291-9-9 in the previous year.

"Out of the 26½ acres under cultivation, 2¼ acres were exclusively reserved during the year for the cultivation of sugarcane during the season 1893-94. A second plot of 2¼ acres has also been appropriated for the same purpose after the *rabi* crops were gathered in. Thus, there are 4½ acres standing now under sugarcane on the Model Farm. The crop looks very promising, and is expected to yield a handsome profit in the current year."

22. Mr. Bhupal Chandra Basu also furnishes the following report on the Sibpur Farm:—

Sibpur Farm.

"(1) The crops under experiment during the year were—jute, *aus* paddy, fodder grasses, wheat, oats, barley, potatoes, sugarcane, cotton, tobacco and cabbage. A large area was also cropped with maize and *dhanche* (*Sesbania aculeata*) in the ordinary fashion. The results of the cultivation of each crop are noted below.

"(2) *Jute.*—The experiment with this crop was a repetition of the experiments made in previous years. It was designed to test the effects of castor-cake and bonemeal for this crop. The first sowing was destroyed by heavy rain; a second sowing came up well, but being late, it gave a poor outturn and resulted in loss in every one of the plots under experiment. The results of the experiment are shown in statement (*a*) in Appendix D. It will be seen that castor-cake applied at the rate of 6 maunds per acre, and costing Rs. 12, gave an increase in outturn, amounting to 4 maunds 23 seers 12 chitaks, valued at Rs. 19-3-6 per acre, over the outturn of the unmanured plot. The use of bonemeal at the rate of 6 maunds, costing Rs. 13-14 per acre, resulted in an increase in outturn of 4 maunds 5 seers, valued at Rs. 17-2-6. The experiment with castor-cake and bonemeal applied to jute has been made every year since 1889. In 1889 the manures failed to increase the outturn, but since 1890 the results of the experiments have uniformly indicated castor-cake to be a suitable manure for jute. Bonemeal has also always resulted in increase of outturn, but the increase failed in one year to cover the cost of the manure; in the other two, it left a small increase in profit over that of the unmanured plot.

"Jute was also grown during the year in seven plots of land having an aggregate area of 1 bigha 12 cottahs (a little over half an acre). These plots have been annually cropped with potatoes since 1887-88 and differently manured; since 1890 they have, in addition to potatoes, borne a catch crop of jute. There cannot be a better combination of crops than potatoes and jute. The former is always liberally manured, and as it also requires frequent hoeings during its growth in the cold weather, it leaves the soil in a fine clean and rich condition for the jute crop. Excellent crops of jute have been raised on potato land in the Sibpur Farm during the past three years. In 1892-93 the largest outturn which was obtained from the plot which had been manured previously for potatoes with castor-cake amounted to 24 maunds 9 seers per acre, and the smallest to 14 maunds 1 seer, the aggregate produce of the seven plots having amounted to 19 maunds 17 seers 10½ chitaks per acre.

"(3) *Aus paddy.*—An experiment with this crop intended to contrast the merits of bonemeal, castor-cake, cowdung, and saltpetre gave results from which no reasonable deductions could be drawn.

"(4) *Fodder grasses.*—As in previous years, sorghum was raised successfully on the farm. The area cropped was 2 bighas (= ⅔ acre); the cost of cultivation amounted to Rs. 16-3-6, and the yield averaged 274 maunds 10 seers per acre. The cost of cultivation thus came to a little less than one anna per maund. A portion of the fodder was sold at 10 pice per maund, and the rest fed to farm cattle.

"With regard to the cost of cultivation, it may be remarked that on land free from weeds and requiring no weeding, sorghum can be raised at a most trifling cost; in half of the land sown with sorghum last year, the cost of cultivation averaged only 2·6 pies per maund, while in two other plots which required hand hoeing and weeding, the cost came up to 23·2 and 14·8 pies per maund respectively.

"During the year a small area, measuring about 4½ cottahs, was laid under lucerne. The crop came up well, and gave its first cutting towards the end of the year. The crop is expected to last in ordinary course for several years, and yield a good profit.

"(5) *Wheat.*—The following experiments were made with this crop.

"(*a*) To ascertain the value of green-manuring wheat with hemp (*Crotolaria juncea*). The experiment was made in duplicate in four plots, two of which were hemped and the other two left unmanured. The hemp was grown as a

bhadoi crop and ploughed in five weeks before the wheat was sown. The unmanured plots were fallow during the rains, and received four more ploughings than the hemped plots. The experiment proved exceedingly instructive. All the four plots were sown on the 23rd October; soon after very heavy rain fell, which destroyed the young seedlings in the unmanured plots, thus necessitating a second sowing nearly three weeks after the first; the hemped plots, on the contrary, did not appear to suffer in the least from the heavy rains, and throve splendidly; in fact the crop in one of these plots became so luxuriant that the tops were mown to keep down the growth. The outturn and cost of cultivation of each of the four plots are shown in statement (*b*) in Appendix D. It will be seen that the average outturn of the two hemped plots exceeded that of the two unmanured plots by 7 maunds 17 seers per acre, and that the former left a net profit of Rs. 4-0-6 per acre, and the latter caused a net loss of Rs. 17-10 per acre. A similar experiment was made in 1891-92, when hemping gave a larger outturn than 'no manure,' but the increase in outturn was not sufficiently large in that year to cover the cost of green-manuring.

"(*b*) To ascertain the effects of saltpetre, castor-cake, and cowdung on wheat. The experiment was made in two series of plots. In one series, comprising four plots, two of which were manured with saltpetre at the rate of 1½ maunds per acre and costing Rs. 7, and the other two left unmanured, the former gave an increase in outturn over the unmanured plots, the increase amounting to 2 maunds 2½ seers only, valued at Rs. 5-11. The increase in outturn thus fell short of the cost of the manure. In the second series, consisting of nine plots, and manured variously with saltpetre, castor-cake, and cowdung, the results were found to be anomalous, the plots which had been laid down for the first time having been evidently of unequal character to begin with.

"(*c*) The third experiment was to ascertain the merits of drilling and dibbling the seed as contrasted with the ordinary method of sowing behind the plough. In one of the three plots under experiment, the seed was drilled by means of a new drilling machine of my invention;* in the second, it was dibbled into holes made with a small stick at intervals of six inches between and three inches in the rows; this method of sowing saved exactly half the quantity of seed required in dibbling and sowing behind the plough. The crop in all the three plots, particularly in the drilled plot, was exceedingly promising in the beginning, but the abnormal rains of February and March did considerable mischief to it, as well as to all other standing crops on the farm. Nevertheless a satisfactory and profitable outturn was obtained, and the superiority of drilling and dibbling was clearly borne out by the results. The results are shown in detail in statement (*c*) in Appendix D: drilling and dibbling would appear to have increased the outturn over that of the plot sown in the ordinary fashion by 2 maunds 10 seers 8 chitaks and 1 maund 28 seers 10 chitaks respectively.

* The machine has not yet been perfected, but I hope to soon bring it to public notice.

"(6) *Oats.*—This crop is new to Lower Bengal. It has been successfully cultivated in the Sibpur Farm every year since 1889-90. The results of cultivation last year were still more satisfactory than in any previous year. The total area cropped with oats was 5 bighas 7 cottahs, which gave an aggregate outturn of 36 maunds 21 seers 4 chitaks of oats, *i.e.*, at the rate of 20½ maunds per acre. The highest outturn was obtained from a plot of 5 cottahs manured with saltpetre, and amounted to 34 maunds 20 seers per acre. The net profit of cultivation of oats in the 5 bighas 7 cottahs of land above referred to amounted to Rs. 50-10-3, or Rs. 29-5 per acre. Oats have been found to require less care in cultivation, and to be considerably more productive than wheat; they can be cultivated with profit in Bengal, although as yet there is hardly any market for oats outside Calcutta where they are in demand for feeding horses. The quality of Indian oats is, however, extremely defective, owing, it is believed, to the gradual degeneration of the original strain introduced from abroad. I have arranged to procure a quantity of Australian and Cape oats through the Agri-Horticultural Society of India, and will try if the quality of the original seed can be kept up by selection and careful cultivation.

"During the year oats also formed the subject of an experiment to test the comparative effects of different manures. The manures tried were saltpetre,

castor-cake, cowdung and bonemeal. Five plots of land having an aggregate area of 1 bigha 15 cottahs were placed under the experiment. They had been cropped in the preceding *bhadoi* season with *dhanche* (*Sesbania aculeata*), a leguminous crop which is credited with the virtue of enriching the soil by means of its roots, and fallen leaves in the same way as clover does in Europe. All the five plots were, therefore, left in an extremely favourable condition for a cereal crop like oats. The details of treatment and outturn of the five plots are shown in statement (*d*) in Appendix D. The crop was so heavy in all the plots, especially in the two plots manured with cowdung and saltpetre, that it was to a certain extent injured by being laid by the continuous heavy showers of February. In spite of the injury, a heavy outturn was obtained from every plot. The plot manured with saltpetre gave the largest outturn, 34½ maunds of grain and 55 maunds 2 seers of straw per acre, which exceeded the outturn of the unmanured plot by 9½ maunds of grain and 20 maunds of straw, valued at about Rs. 28. The application of saltpetre resulted in a net increase in profit, amounting to Rs. 20-7. Castor-cake and cowdung also left large increase in net profit after deducting the cost of the manures, but bonemeal left a nominal profit of only Re. 1-4 per acre.

"(7) *Barley.*—Barley was grown on just one acre of land. The seed was obtained from Dumraon. The Bihar variety of barley is of much larger size than the Bengal variety, and yields a larger proportion of flour than the latter. It was grown with great success in the Sibpur Farm last year, the outturn of the one acre of land having amounted to 27 maunds 26 seers of grain, and 28 maunds 14 seers 12 chitaks of straw. The results of the cultivation of the Bihar variety of barley in the Natuda Farm last year were also satisfactory, and it is expected that a demand for its seed will arise in the locality in the coming season.

"(8) *Potatoes.*—The potato crop of the Farm was a poor one last year on account of damage caused by heavy rain about the end of October and the beginning of November, which came immediately after the sowings. Much of the seed rotted in the field, and although blanks were filled up later on, the crop did not appear to rally from the injury caused by the heavy rainfall. The results obtained in one experiment, as will be seen from statement (*e*) in Appendix D, testified, as in previous years, to the usefulness of castor-cake, cowdung and bonemeal as manures for potatoes. A second experiment was made to test the effects of green manuring with hemp. The results shown in statement (*f*) in Appendix D proved that green manuring with hemp was more profitable than manuring with castor-cake, and that the combined application of hemp and castor-cake was more profitable than the use of either of these manures singly.

"(9) *Sugarcane.*—The sugarcane crop was very badly injured last year by the 'borer' insect not only in the Farm, but everywhere in the neighbourhood. Most of the experimental plots gave a very poor outturn, and as they were unequally affected, their outturn cannot be compared among one another. Eight small plots of ratooned sugarcane escaped injury. These had been planted in the previous year with eight different varieties of sugarcane. The results of the ratooned crops, given in statement (*g*) in Appendix D, are of interest as showing the varieties best suited for ratooning. The results of the cultivation during the first year, exhibited in statement (*b*) of Appendix I of the Annual Report of 1891-92, showed Red Saharanpur (known also as Black Bombay in Bengal) and *samsara* to be the most productive of the eight varieties tried, but the results obtained from the "root" crop of last year showed *samsara* (the most popular variety of Central Bengal) to be almost useless for ratooning, and *khari* and Red Saharanpur to be the best suited for this purpose. The experiment confirms the experience gained in the Burdwan farm as to the great adaptability of *khari* cane for ratoon cultivation. It will be seen from statement (*g*) that the outturn of the ratoon crop of *khari* was largely in advance of the outturn of the first crop of 1891-92, while that of every one of the other varieties fell off.

"(10) *Cotton.*—Two varieties of cotton were experimented with last year—the New Orleans—an American variety, and the Garo Hills. The former grew well in the beginning, but the plants became sickly and gave little outturn; the

variety does not appear to be suited to the humid climate of Lower Bengal. The Garo Hills variety grew well, and looked extremely healthy throughout. It was grown on 10 cottahs of land, the outturn of which was 9 seers 12½ chitaks of cleaned cotton. The rate of outturn reduced to acre and pounds on the basis of 3 bighas to the acre and 2lbs. to the seer was 117⅜ lbs. per acre against 95 lbs., which is supposed to be the average rate of outturn of cleaned cotton per acre in Bengal. The proportion of lint to seed cotton was found to be unusually high in the Garo Hills variety, being as 46·7: 100.

"The 'roots' of both the varieties have been preserved with a view to get a second crop in the current year.

"(11) *Tobacco.*—The cultivation of tobacco was undertaken for the first time in the Sibpur Farm with the two-fold object of gaining experience in the cultivation and curing of tobacco, and of noting the respective merits of well-known native and foreign varieties. With this view, seed of three country varieties and of three American varieties was procured. The country varieties were (1) *Rangpur*, the ordinary variety grown in the districts of North Bengal; (2) *Matihar*, also called *hamaku* in North Bengal; and (3) *Hingli*, a popular variety of Nadia and Jessore. The foreign varieties of which seed was obtained through the Agri-Horticultural Society of India were (1) *Havana*, (2) *Virginian* and (3) *Kentucky*. The seed of the last two varieties failed to germinate, but that of *Havana* came up well.

"The three country varieties and the *Havana* were planted in small and contiguous plots of land, having an aggregate area of one-third of an acre. They were manured before planting with nitrous earth dug out of an old cattle shed, and subsequently with two kinds of artificial manure, namely, saltpetre and sulphate of potash, both of which manures supply potash, an ingredient in which Indian tobacco is said to be deficient, and which is required in larger proportion to make it burn well.

"All the four varieties grew well and gave a good outturn. The details of the cultivation and outturn are exhibited in statement (*h*) in Appendix D. In point of gross outturn of leaf, the *Rangpur* variety (which may be called a giant among the known species of tobacco) stood first; the *Havana* followed closely on it, then the *Hingli*, and last of all the *Matihar*. In respect of quality, I am unable to say much as yet, as the tobacco is still in bulk and cannot be sold for a month or two yet. The *Havana* appears to have a milder and sweeter flavour than any of the others, and from some enquiries I have made, it seems to be fitted for the manufacture of cigars. I intend to have it made into cigars, and have them appraised by competent authority. The Rangpur variety is a little coarser than *Havana*, and has thicker mid-ribs and veins, which take away from its value as cigar material. It is much milder, however, than the *Hingli* and *Matihar*, the last of which has an extremely strong flavour, and is fit only for use in *chilum*. Both these varieties have small leaves, those of the *Hingli* being smooth, and of the latter thick and crumpled not unlike those of cabbage.

"The leaves were cured in the shade, the directions prescribed for shade-curing as practised in America having been closely followed by me as far as I could. I am far from being sanguine as to the result, but nothing can be said as yet on this point until the opinion of an expert has been obtained.

"Turning now to the action of the two artificial manures used, it will be seen from statement (*h*) in Appendix D that except in one of the four sub-plots, sulphate of potash gave a larger outturn than saltpetre. It would be, however, rash to generalise on the results of a single year.

"(12) *Cabbage.*—An experiment was made to contrast the merits of saltpetre with those of castor-cake as manure for cabbage, which is largely grown in the country around Calcutta. The crop is very heavily manured with castor-cake, which is used often to the extent of 60 maunds per acre. A casual trial in a neighbouring raiyat's field in the previous year having indicated the usefulness of saltpetre, an experiment was made during the year in the Farm, which fully confirmed the previous experience. For this experiment a small plot of land, measuring one-eighth of an acre, was planted with cabbage, the land being manured at the planting time with one maund of castor-cake. After the plants had taken root, the plot was divided into two equal plots, one of which was manured in two dressings with three maunds of castor-cake, costing Rs. 5·4, and

the other with 22 seers of saltpetre, costing Rs. 2-12. The outturn was not weighed, but every one who saw the standing crop could readily see that the crop in the sub-plot manured with saltpetre showed larger heads of cabbage than the one manured with castor-cake. Thus both the difference in outturn and the price of the manure were in favour of the use of saltpetre.

"(13) *Conservation of Manure.*—During the year I paid much attention to the conservation of cowdung in the Farm. Hitherto the dung of the farm cattle used to be kept outside on bare ground, and to be thus liable to considerable wastage by washing and evaporation. No attempt had been made to save the urine which is as valuable, if not more so, as the solid excrements. To prevent the waste of dung and urine, the cattle-shed was paved during the year with bricks set on edge with a gentle slope on each side, along which a shallow channel leads the urine into a small masonry pit. The dung as well as the urine are collected every morning and thrown into two dung pits which are also lined with bricks in order to prevent soakage. Once every week the weekly accumulation of dung, urine and refuse straw is mixed up thoroughly with a *kodali* and stamped down by the feet. Manure so kept can lose no part of its valuable constituents.

"(14) *Insecticides.*—An experiment was made during the year with various substances which are generally credited with the power of protecting seeds in store from the attacks of weevils and moths. The substances tried were sand, ashes, *nim* leaves, turpentine oil, camphor and bisulphide of carbon; and the seed experimented with was sorghum. Each of these substances was used in one *ghara* filled with sorghum seed. The sand, ashes, and *nim* leaves were mixed up with the seed in three vessels; a lump of camphor was placed in the fourth; in the fifth was placed a small open phial of turpentine, and in the sixth, a small open phial of carbon bisulphide. The mouths of the vessels were securely closed with clay, so that no insects could get in from outside. After the seeds had been kept in the vessels for over six months, they were opened and examined. The seed in all but one vessel was found to be swarming with weevils; the exception was the pot in which carbon bisulphide had been placed. The seed taken from this pot looked quite as fresh as on the day it had been stored. The experiment was conclusive as to the efficacy of bisulphide of carbon as an insecticide in stored grain.

"(15) *Receipts and expenditure.*—Statement (*i*) in Appendix D—shows the receipts and expenditure during the year 1892-93. The gross expenditure was Rs. 2,979-0-7 against Rs. 2,789-5-6 in the previous year. The cause of the increase was that a large amount of municipal taxes (Rs. 465) had to be paid for the first time during the year; but for this, the expenditure of the year would have been Rs. 275-4-11, less than that of 1891-92. The actual cost of cultivation amounted to Rs. 1,522-8-1, out of which Rs. 1,049-7-9 was recouped by sale proceeds of agricultural produce. Besides the latter, Rs. 175-13-9 was realized from miscellaneous sources of income, such as grass, fish, fruits, &c. The actual cost of maintaining the Farm amounted during the year to Rs. 1,753-11-1, out of which Rs. 465 being the municipal taxes which have to be paid in any case by Government may be deducted."

Natuda Model Farm.

23. This farm was established last year at Natuda in the Nadia district by Mr. Bipradas Pal Chaudhuri, a wealthy zamindar of the district, with the object of spreading a knowledge of useful agricultural improvements among his tenantry. The farm was managed in consultation with Mr. Bhupal Chandra Basu, Assistant Director of the Agricultural Department. Mr. Pal Chaudhuri's report on his operations during the year under review is given in Appendix E.

The farm has an area of a little under 100 acres, and consists of 30 acres of low paddy land, and of nearly 70 acres of dry upland suited to the cultivation of *bhadoi* and *rabi* crops. The improvements claimed to have been introduced last year were—

(1) The cultivation of several new staples and improved varieties of crops, including Buxar wheat, oats, maize, potatoes, up-country barley and gram, and *sorghum* and *reana*. All of these, except gram and potatoes, gave fairly good outturn; gram failed to germinate, and the outturn of potatoes was poor, owing, it is said, to poor soil and deficient means of irrigation.

(2) The use of several improved implements.—(*a*) Some soil-inverting iron ploughs manufactured by Messrs. Ransomes, Sims and Jefferies of Ipswich were used in preparing a large area of land for chillies; (*b*) a set of American hand-hoes (Planet, Jr.) were found extremely useful in cleaning the interspaces between rows of a chilli crop, and (*c*) a maize-huller was used in threshing 190 maunds of corn, at a cost of only two pice per maund, and caused a great saving in the cost of separating the grains.

(3) The utilisation of cowdung, which is at present wasted by the Nadia raiyat. Mr. Pal Chaudhuri says that his example has already opened the eyes of his tenants to the usefulness of this manure.

Mr. Pal Chaudhuri has several permanent works of improvement in view, one of which is the connecting the river Bhairab with the lowland area in his farm by means of a *khal*, and thus ensuring an adequate supply of water. The work has been nearly half completed.

The financial results of the farm during the year under report were not satisfactory, the receipts having fallen short of the expenditure by about Rs. 300. Mr. Pal Chaudhuri does not, however, attach much importance to the financial results of the first year, which was, he says, naturally one of experiment and enquiry; and he adds that he does not hope to be able to bring his farm into full working order until another two years have passed.

OTHER AGRICULTURAL EXPERIMENTS.

Burdwan Division.

24. *Burdwan—Private estates.*—In the year 1890-91 three raiyats in the neighbourhood of the Burdwan Farm undertook experiments under the instructions of the overseer of the farm. In the following year sugarcane and jute were experimentally cultivated by four raiyats. During the year under review there were 36 experimenters. Three raiyats cultivated Naini Tal potatoes for the first time and obtained satisfactory results, their outturns ranging from 60 to 67½ maunds per bigha. Twelve are for the first time growing *khari* sugarcane, with the object of ratooning their crops, two are growing ratooned *khari* crops, while the rest are growing local canes of the Samshara variety on a better system of cultivation, consisting in planting cuttings in trenches, instead of sowing them in shallow lines as is generally done in the locality, and in giving a more liberal manuring than that ordinarily given.

The cultivation of Buxar wheat was tried in two private estates in the Raniganj subdivision, but the experiment was not successful.

24. *Burdwan Raj—Wards' estates.*—The cultivation of Naini Tal potatoes was tried during the year at Bhandiban in the district of Birbhum, and at Nandagram in the district of Burdwan. The crops in both places were grown from seed purchased in Calcutta. The manures applied were castor-cake and cowdung. The outturn in the former place was satisfactory, amounting to 36 maunds 30 seers per bigha. The results would have been still better had not the crop been damaged by heavy rain at the end of February and beginning of March. At Nandagram new land was broken up for potato cultivation; and to this cause may be partially attributed the bad result obtained here, the outturn from one bigha amounting to 11 maunds 10 seers only. The crop here was also seriously injured by the rain in February and March. The overseer of this Department, who supervised the experiments at Bhandiban and Nandagram, reports that the raiyats of the former village will cultivate Naini Tal potatoes on their own account during the current year. A raiyat of Bhandiban has commenced the experimental cultivation of jute and *khari* sugarcane. The cultivation of oats was also tried at Nandagram with the object of inducing the raiyats to grow this crop. The outturn amounted to five maunds per bigha, but the result was financially a failure.

26. *Midnapore—Wards' estates.*—In the Midnapore district agricultural experiments were undertaken in Turka, Malighati, Mohespore, Burathurhingly, and Nayagram. In Turka, potatoes, wheat, sugarcane and cotton were tried by the Manager. All of them failed except wheat, which gave fairly good results. In the Malighati estate, potatoes and sugarcane were experimentally cultivated. The former yielded a profit of Rs. 6 per bigha, on the demonstration farm of the estate, and also gave satisfactory crops to three raiyats;

but in other cases the crop proved more or less a failure on account of excessive rainfall after the sowing of the seed. The results of the sugarcane cultivation will not be known till next year. In Moheshpore the cultivation of both potatoes and wheat was tried, but proved unsuccessful, owing, it is said, to untimely and heavy rains in February. The soil of this estate is reported to be unsuitable for wheat cultivation. The experimental cultivation of sugarcane undertaken in the Burathurhingly estate was not financially successful. In the Nayagram estate the experimental cultivation of potatoes and wheat at a total cost of Rs. 44-4 yielded a profit of a little over Rs. 11, and one rupee per bigha respectively. The Manager says the results would have been better but for excessive rainfall. Money not having been available for agricultural experiments from the funds of the Basudebpore estate, where crops had been cultivated experimentally in previous years, the cost of experiments during the year under report was defrayed by this Department. Experiments were made with potatoes in two places: in one place the cultivation failed on account of injury by red ants, and in the other the crop obtained was fairly good (20 maunds per bigha).

PRESIDENCY DIVISION.

27. *Jessore—Private estates.*—In consequence of the generally encouraging results obtained from the cultivation of potatoes in the preceding two years, a Muhammadan gentleman of Govindpur, in the Sadar subdivision of Jessore, was induced to try the cultivation last year. He was supplied by this Department with 10 maunds of "Bombay" seed-potatoes. He distributed the seed among a number of his tenants. Heavy rainfall about the sowing time and in February was much against the success of the experiment; and four only of the twelve raiyats who undertook the cultivation got a good outturn, one of these obtaining 10½ maunds of potatoes from three cottahs of land, *i.e.*, at the rate of 70 maunds per Bengal bigha. The remaining eight cultivators obtained a very poor outturn. The cultivation of potatoes is still new in the locality, but it is hoped that it has already met with favour from the cultivators of the neighbourhood, and may soon become popular.

28. *Khulna and Murshidabad.*—Experiments in the cultivation of potatoes were made at Khulna and Murshidabad, where the cultivation of potatoes had hitherto been unknown. Mr. Nitya Gopal Mukerji, who was entrusted with the supervision of these experiments, reports that they "have fulfilled their object, and no further effort on the part of this Department to establish the cultivation of this crop need be made." The total outturn of potatoes obtained from 2½ maunds of seed at the Khulna Jail was 25 maunds—a result which may be considered fairly satisfactory. The Jailor estimates the cost of cultivation at Rs. 22-8, and the value of the crop at Rs. 62-8. An experiment in the Berhampur Jail, however, turned out a failure, owing to ravages by red ants. An experiment was also made by Mr. Mukerji in the cultivation of ground-nuts, but it failed owing to the bad quality of the seed. The cultivation of sugarcane which was undertaken at Cassimbazar, and reported on in last year's Annual Report, was not at all successful, the total outturn of gur from 1 bigah and 15 cottahs of land having been 17 maunds 25 seers, valued at Rs. 63-14, against a total expenditure of Rs. 351-12. Buxar wheat was tried in the Cassimbazar estate in the Murshidabad khas mahals, and is reported by the Commissioner to have been unsuccessful.

RAJSHAHI DIVISION.

29. *Pabna—Government estates.*—Potato seed was distributed among the raiyats of two Government estates in the Sirajganj subdivision of Pabna, but the crops failed for want of proper cultivation.

30. *Jalpaiguri—Government estates.*—In the Mainaguri Tehsil of the Western Duars in Jalpaiguri, numerous experiments were made during the year in continuation of those of previous years. The crops tried were Naini Tal and Khasia Hills (known ordinarily as 'Bombay') potatoes, sugarcane and Havana tobacco. The results were briefly as follows:—

Potatoes.—During the year 15 maunds of fresh Naini Tal seed and six maunds of Khasia Hills seed were supplied to jotdars and others at Jalpaiguri

and in the Mainaguri Tehsil. It was found on enquiry that in consequence of the distribution of Naini Tal seed by this Department in previous years in the Mainaguri Tehsil, the cultivation of this excellent variety of potatoes has firmly established itself in the locality, and that numerous jotdars had saved seed from the previous year's cultivation. The fresh seed distributed last year was sown in twenty different places; the results were that in one place the outturn was stated to be twenty-four times the seed used, in three places it was from sixteen to twenty fold, in five places from ten to fifteen fold, in four places from five to ten fold, and in seven places the crop more or less failed. On the whole the results may be considered very satisfactory. Owing to the custom of growing potatoes in rows interspersed among the tobacco crop, it was not found possible to state the outturn in terms of maunds and acres.

Sugarcane.—It was mentioned in the Report for the preceding year that sugarcane was planted in two villages with the object of teaching the raiyats an improved method of cultivation and of manufacturing *gur*. The variety planted was *samshara*, the most popular variety grown in the country around Calcutta. The crop grew well, but unfortunately the abnormal floods of July last year completely destroyed it in one place, and so much injured another field, that the crop could not recover properly in spite of every possible care that was given to it. The experiment will be repeated in the current year.

Tobacco.—Havana and two varieties of American tobacco (Virginia and Kentucky) were distributed among six jotdars in the Mainaguri and Falakata Tehsils. The American varieties failed to germinate. Havana was sown in three jots. In two it is reported to have germinated well and to have given a fair crop, in the third it failed. No detailed report has, however, been yet received on the subject.

During the year a small farm was established at Mainaguri in close proximity to the Tehsil Office. It has been placed under the management of the Tehsildar. The establishment of the farm having been sanctioned late in the year, nothing beyond laying out the farm and equipping it with sheds, a wall, &c., was done during the year.

31. *Rangpur—Wards' estates.*—The Sonthal colony at the Goraghat jungle, which was established by Maulavi Bazlal Haq in the Burdhankoti estate in Rangpur in the year 1889, is reported now to contain 750 persons, and the flow of immigration still continues. The Sonthals grew mustard and Indian-corn with great success during the year under report.

32. *Dighapatiya.*—In the Dighapatiya Farm in Rajshahi experiments were made during the year with aus paddy, sugarcane, wheat, oat, potatoes, cotton, fodder grasses, mustard, linseed, and peas.

Aus paddy.—Four bighas of land were set apart for the cultivation of this crop, the outturn of grain from which amounted to 33 maunds, yielding a profit of Rs. 11-11, after paying all costs of cultivation.

Sugarcane.—This crop, which was raised from cuttings of the *khari* variety supplied from the Burdwan Farm, and which was stated to be flourishing in last year's annual report, is now reported to have yielded an outturn of 31 maunds 32 seers and 1 chittak of gur per bigha. The gain to the estate on the cultivation of this one bigha amounted to Rs. 82-8-3. This result may be considered to be very satisfactory.

Wheat.—The experiment with Buxar wheat was made on two plots of land, measuring a bigha each. The first of these, which had been previously cultivated, yield 3½ maunds of grain per bigha, while the second, which was brought under the plough for the first time during the year under report, yielded only 2 maunds per bigha. These outturns are reported, however, to have been much higher than that obtained by some of the raiyats with their country wheat. The quality of the grain of the Buxar wheat was far superior to the country wheat, as appears from the appraisement of the samples sent to the Agri-Horticultural Society. The Secretary to the Society values the Buxar wheat at Rs. 3-0-6 per maund, and the country wheat at Re. 1-2 per maund only. The experiment confirms the experience of the previous year, and points to the suitability of the Dighapatiya soil for the cultivation of the Buxar variety of wheat.

Oats.—The cultivation of this crop was also successful. Two bighas of land yielded an outturn of 16 maunds 17½ seers, and a net profit, after deducting

all costs of cultivation, of Rs. 23-13-6, results which may be considered very satisfactory. The quality of the grain was good, being appraised by the Agri-Horticultural Society at Rs. 4 per maund.

Potatoes.—Naini Tal potatoes were grown on a small plot of land, in order to compare the outturn with the country variety of potatoes. The outturn of the former amounted to 47 maunds 24 seers per bigha, and of the latter to 28 maunds 34 seers per bigha. The experiment was considered successful by the Manager, but the results would have been still better had not the crop suffered from excessive rainfall at the commencement of their growth.

Cotton.—The experiment with this crop was unsuccessful—a result attributed by my Assistant, Mr. Banerjei, to the seed having been sown too closely.

Fodder grasses.—Ten bighas of land were set apart for the growth of different kinds of fodder grasses for the use of the live-stock of the estate.

Mustard, linseed, and peas.—The cultivation of mustard was successful, yielding a net profit of Rs. 5-8 per bigha, but a mixed cultivation of linseed and peas resulted in a loss of Rs. 3-6-5 per bigha.

Chittagong Division.

33. *Noakhali—Government estates.*—The only experiment undertaken in the Government estates of this Division was in Noakhali, where Rs. 35-3 were spent by the Collector on potato cultivation. The crop was destroyed by grubs.

34. *Chittagong—Wards' estates.*—Buxar wheat was grown at Katgur and Satkania in the estate of Fazalali Khan on three bighas and twelve cottahs of land. The crop suffered from want of rain, and the produce, which amounted to 9 maunds 10 seers, is not considered satisfactory, although it left a net profit of Rs. 4-1. It will be remembered that the cultivation of Buxar wheat in this locality gave fairly good results in 1889-90, and again in 1891-92. Experiments were undertaken in the cultivation of English vegetables, *e.g.*, cabbage, lettuce, beet-root, knol kohl, peas and turnips in the Dohazari estate as well as in the Chakma Raja estate, both under direct management, and through raiyats to whom seeds and plants were distributed. The cultivation is reported to have been very successful, and to have been much appreciated by some of the raiyats. Potatoes were cultivated by the Manager on a small area and were found to grow well. Tobacco from Rangpur and Havana seed has also been grown, but the results are not yet known.

Patna Division.

35. *Shahabad—Government estates.*—The Subdivisional Officer of Sasaram reports that Spanish gram and vegetable seeds were tried in the Sasaram garden, attached to Sher Shah's tank, with satisfactory results. A pit silo was made last July at Arrah, under the supervision of this Department. It was filled with 80 maunds of *dub* grass and *jowar*, which were then covered with earth well pressed down, and protected by a tiled roof. The silo was opened on the following May in the presence of about 200 raiyats. The Collector of Shahabad reports that the contents, except about three inches of the tops and sides, which were mouldy, were perfectly sweet and were greedily eaten by cattle.

36. *Saran—Private estates.*—One maund of Buxar seed wheat was supplied by this Department through the Collector of Saran to the Manager of the Hutwa Raj. It was sown in four places, in three of which it proved to be superior in quality and larger in quantity than the local wheat, but in the fourth, although the quality was found to be superior to that of the local variety, the outturn was less in quantity than that of the latter. The Manager of the Raj reports that on the whole the results were more encouraging than in previous years.

Orissa Division.

37. Agricultural experiments were made in the Government estates of Noanund in Balasore, Khurda in Puri, and Banki in Cuttack, and in the Wards' Estates of Modhupore in Cuttack.

Government estates.—An experiment was made in potato cultivation in the Government estate of Noanund in Bhadrak, with the object of inducing raiyats to grow the crop. Two and-a-half maunds of seed sown in ten cottahs of land gave an outturn of seven maunds only. The Collector ascribes this poor result to late sowing, but from the quality of the potato produced, he thinks that the soil is well suited for its cultivation. The experimental cultivation of Buxar wheat at Khurda was not a success. Cuttings of two varieties of sugarcane, viz., *samshara* and *khari*, were supplied in 1891-92, from the Burdwan Farm to the Banki estate, in order to compare the merits of the canes with the local canes. The experiment was interfered with by high floods, which seriously damaged the plants, but the Collector hopes that another trial under favourable circumstances will be given to the cultivation during the current year. The cultivation of fine paddy at Banki, from seed supplied by this Department, was attended with success. The Collector reports that the sum of Rs. 8-1-3 was spent in the cultivation, and that the receipts amounted to Rs. 17-10-3. A sample of the produce was appraised by the Agri-Horticultural Society, and pronounced to be superior to the *dadkhani* rice of the Calcutta market.

38. *Wards' estates.*—Experiments in the Madhupur estate were made with sugarcane, potatoes, fine paddy, and tobacco. Three varieties of cane were tried, viz., Bombay, *khari*, and *samshara*. The crops grown from cuttings of these varieties are reported to have suffered from want of rain in April and May, and from heavy floods in August and September, but the Commissioner thinks that the outturn was sufficient to permit description of the experiment as a success. Experiments were also made with these varieties of cane by some raiyats of the estate, but the result of their cultivation is not reported. Naini Tal potatoes were cultivated experimentally both by the Manager and by the raiyats of the estate. The experiment made by the Manager was not a financial success, but the Commissioner reports that the Naini Tal potatoes grown were superior both in size and quality to the country produce. With the object of introducing the cultivation of fine paddy in the estate, seed was imported from Diamond Harbour and supplied to the estate by this Department. The experiment seems to have been successful. The outturn of five bighas amounted to 42 maunds 8 seers. The Commissioner reports that the raiyats of the estate are desirous to try the cultivation on their own account. In order to encourage this cultivation, two maunds of fine paddy seed have been despatched during the current year for free distribution among selected raiyats in Cuttack. The experiments with tobacco were not attended with any success.

Chota Nagpur Division.

39. *Manbhum—Wards' Estates.*—Experiments were made in the Jharia estate in the cultivation of poatoes and American cotton. The experimental cultivation of potatoes at Jharia in previous years had excited interest among the cultivators of the neighbourhood, and last year 16 persons applied for, and were supplied with, seed potatoes of two kinds, viz., the Naini Tal and the Khasia Hills. Three plots of land, having an aggregate area of two bighas, were cultivated with potatoes under the direct management of the tahsildar of the estate, and gave an outturn of 33 maunds. Five of the 16 cultivators supplied with seed obtained outturns varying from 20 to 30 maunds per bigha, and one obtained a good crop, which amounted to 50 maunds per bigha. The other experiments more or less failed, on account, it is said, of the excessive rain during the last cold weather. An experiment was also made by the Subdivisional Officer of Govindpur in the cultivation of potatoes, but the outturn was poor owing to injury by excessive rain. American cotton was tried, but is reported to have been a failure. Buxar wheat was experimentally grown by two gentlemen in Singhbhum and Palamau, but the results in each case were unsuccessful.

THE UTILIZATION OF BONES AS MANURE.

40. The manufacture of bonemeal was continued during the year under report at the Jalpaiguri and Darjeeling Jails, and was also introduced into the Saran Jail. The bonecrushing operations at the Jalpaiguri Jail having proved financially successful were transferred in July last to the exclusive supervision of the Jail Department. The work was suspended for a long

time for want of raw bones. The total outturn of bonemeal amounted to 77 maunds 25 seers, the whole of which was disposed of for Rs. 110-8. The principal purchasers were the Manager of the Good Hope Tea Estate, Western Duars, and Mr. J. C. Stalkartt of the Hope Town Tea Estate, Darjeeling. The Superintendent of the Jail reports that he has received an order for 1,000 maunds of bonemeal from the first-named gentleman.

No information has been received from the Darjeeling Jail as to the outturn and sale of bonemeal.

The manufacture of bonemeal was introduced at the Saran Jail in November 1892, and continued till the end of the following March, when work was suspended for want of raw material. The total outturn of bonemeal was 200 maunds, the whole of which was purchased at Re. 1-8 per maund by Mr. J. D. MacGregor of the Arrowa Factory, Saran, for experimental use on indigo lands. The bonemeal has been put on indigo lands at the rate of ten maunds per local bigha. The actual cost of making the 200 maunds of bonemeal was as follows:—Raw bones 225 maunds, Rs. 100; labour of 1,506 convicts at one anna, Rs. 94-2; total, Rs. 194-2. The actual cost per maund of bonemeal came, therefore, to a little under Re. 1; but it is likely to average from Re. 1-4 to Re. 1-8 per maund in future.

The Superintendent of the Jalpaiguri Jail found bonemeal to be very good for cultivation of cauliflowers in his jail garden. He also reports that the experiment in manuring young tea with bonemeal on the Good Hope Tea Estate has been successful, and that Mr Thomson, the Manager of the Estate, has commenced crushing bones by steam-power. The testimony of Mr. J. C. Stalkartt of Hope Town, who had purchased 100 maunds of bonemeal from the Jalpaiguri Jail, is not, however, quite favourable. The manure was applied to some tea lands on the estate last year, but has not hitherto shown any appreciable effect. The Reverend Mr. Campbell of Pokhuria, who manured some paddy lands with bonedust in 1891, reports that the manure has hitherto shown no effect, but he believes from the abundant growth of grass on the land so manured that it will probably show its effect in the present season. Mr. E. E. Lowis, late Commissioner of the Rajshahi Division, and the Reverend Mr. Nagel of Saidpur in the Rangpur district, speak well of the manure which they found useful for roses and garden crops. The results obtained from the application of bonemeal and boneashes in the experimental farms managed by the Department have been separately reported upon.

This Department has taken an active interest in the question of the utilization of bones since 1890. The results of the action taken appear to be—

(1) That it has been shown that bonemeal can be made at cultivators' homes with the help of the common Indian lever-mill at a cost not exceeding Re. 1-8 per maund, which is far below the wholesale price of the manure in Calcutta, and that bones can be rendered soft and easy to crush by fermentation with dung, ashes or lime.

(2) That the manufacture of bonemeal has been shown to be a profitable jail industry, the future of which depends, however, on the manure becoming popular.

(3) That experiments in farms and by private individuals have shown bonemeal to be a useful manure for certain soils and crops, but that in many places its action has been found to be slow and inappreciable.

(4) That bone-ashes, which can be easily prepared by burning bones with the help of a little fuel, have been found useful for potatoes and sugarcane on which they have been tried; and

(5) That experiments with the manure have so far failed to arouse any interest among the native cultivators, but some good result is expected from the experiments which are now in progress in several tea and indigo factories.

AGRICULTURAL IMPLEMENTS.

41. *The Sibpur plough.*—During the year 1891-92 six wrought-iron ploughs were supplied to the Reverend Mr. Graham of Kalimpong, who, as stated in last year's Annual Report, considered their general introduction in the hills hopeless, but hoped that distribution of the ploughs among the raiyats would stimulate them to improve their own wooden plough. From the report now furnished by

the Reverend Mr. Graham it would appear that the ploughs have not found favour with the cultivators. The Reverend Mr. Graham remarks that they do well on fairly level ground, but do not seem suited for hill slopes.

The Manager of the Nayagram estate in Midnapore reports that the plough is drawn easily by country bullocks, and has worked well in inverting light soils, but has not been found suitable for muddy soils. The share has been found to wear away by constant use in sandy soils. The Sibpur plough supplied to the Subdivisional Officer of Gobindpore in Manbhum in the year 1890-91 was not worked during the year under review, as the previous year's experience had shown that the plough was too heavy for the country cattle, and that the beam snapped when the share touched under-ground stones or roots. The Subdivisional Officer states that with a good pair of bullocks and a good beam the plough is very useful for a second ploughing, but for new land it is comparatively useless. Mr. J. W. Crowdy, who has in previous years given a favourable opinion on this plough, reports that he still uses it; he finds that it is apt to get out of order. The Sub-Deputy Collector of Banki reports that Sibpur wrought-iron and Baldeo ploughs are not liked by the people, as they are heavy, and are said to be inferior to the wooden ploughs in use. The khas mahal tahsildar, Serampore, reports that on account of the heaviness of the Sibpur ploughs, the cultivators prefer their own ploughs. The Commissioner of Patna reports that the raiyats in the estate of Minor Bhagwat Narain Singh have given up the use of the Sibpur wrought-iron ploughs, as they find them too heavy for their cattle. The Secretary, Municipal Committee, Amritsar, reports that the Sibpur ploughs are still used at the municipal farm, where they are found to work satisfactorily. The zamindars, however, have not yet adopted them. In December 1891 two Sibpur ploughs were supplied to the District Deputy Collector of Broach, who reports that they work much deeper than the local ploughs. The plough turns over a given area of land far more expeditiously than the Gujarat plough. It is stated to be as simple in its construction as the local native plough, and to be repaired without any difficulty by the village blacksmiths. The Director of the Agricultural Department in Bombay asked for ten more Sibpur ploughs for Broach, which were supplied to him in February 1893.

The Manager of the Dighapatiya Estate reports that the Sibpur plough proved useful and worked well, though it was found rather heavy for the country bullocks.

The Manager of the Madhupur Estate states that the Sibpur ploughs supplied to him were found beneficial only for those crops which required deep cultivation, and were accordingly used in the estate lands for the experimental cultivation of sugarcane, potatoes and other similar crops requiring deep tillage. The raiyats objected to using them in their paddy lands as they found them too heavy for their bullocks. Three ploughs were purchased during the year by the raiyats, but do not appear to have been put to any use. In 1891-92 a Sibpur plough was supplied to Babu Govin Sunkur Roy of Cuttack. He reports that he could not work the plough with ordinary bullocks, as the draught was found too heavy. With a pair of stronger bullocks he found that the plough works well, and is decidedly superior to the ordinary country plough.

The Superintendent of the Purnea Jail reports that the two Sibpur ploughs supplied to him in 1890 have been working well during the year under report. In 1891 a Sibpur plough was supplied to Babu Ananda Chandra Rahut of Jalpaiguri for experiments in the Western Duars. This gentleman reports that the plough has not proved as successful as was anticipated. It was found too heavy for the country bullocks, particularly in the rainy season, when the soil becomes soft by heavy rain, and the share then goes down about 10 or 12 inches deep. The plough was found useful, however, in bringing waste lands into cultivation during the winter season when the soil was dry. Babu Chunder Nath Chowdhury of Chatkabaria in Barasat, who purchased a Sibpur plough last year, reports that the cultivators appreciate the working of the plough, but that they are too poor to purchase such ploughs for themselves.

42. *Water-lifts and Tube-wells.*—Three hand chain pumps (water-lift) were sold during the year by the Bengal Iron and Steel Company of Barrakar. The Manager of the Cassimbazar estate, who was supplied with two pumps during the year 1891-92, reports that they were not required for lifting water

last year. The Manager of the Dighapatiya Estate in Rajshahi, who was supplied with a pump in 1891-92, states that the result of his experiments during the year under report was not very hopeful. He proposes making further trials. The purchase of two tube-wells at a cost of Rs. 400 was sanctioned during the year for the Cassimbazar estate, but they have not yet been experimented with. It is reported that they will be ready for trial during the current year. The Collector of Gaya reports that a tube-well was sunk in the Government estate of Karan Pura to a depth of 44 feet in a sub-soil of stiff yellow clay. The experiment seemed to show that in a stiff clay soil a tube-well is useless, and that a 25-feet limit under a simple draw pump is also useless for the Gaya district, where in the hot weather numbers of the wells are dry to a depth of 40 feet. The experiment was made in March in a locality when the water was at the time about 15 feet below the surface. In the hot season the water here falls to 30 feet. The Collector proposes to bore through to a further depth of 30 feet (apparently to a depth of 60 feet) in the hope of tapping a spring. The Collector reports two noteworthy successes in the use of tube wells in the Gaya district. One of them relates to the well supplying the locomotives in the railway station. The depth of that well is considerable, but the Collector does not know the exact dimensions. The well ran dry in the hot weather. A 6-inch pipe was driven through the bottom to a depth of 20 feet below. The water burst in and the pipe was lost, but water has never failed since. The cost was trifling. The other relates to the Jubilee well in Tikari, which was sunk to a depth of 40 feet, when all hope of success seemed to be at an end. A smaller well was then driven down in the centre to a further depth of 20 feet. The water rose 40 feet in a night, and has stood at that height (roughly 20 feet from the surface) ever since. The results are important as showing the possibility of obtaining water for irrigating sugarcane in the Gaya district in May in the hottest season when the ordinary wells run dry.

43. *Sugarcane mills.*—The Commissioner of the Rajshahi Division. reports that Bihia sugarcane mills were as usual largely used in the Maldwar Wards' and in the Sankarpur estate in Dinajpur. One mill was also purchased for the Dighapatiya Wards' Estate in Rajshahi, which is stated to have worked well.

In the Burdankhoti estate in Rangpur, 400 sugar mills supplied by Messrs. Burn and Company, of Howrah, were hired by the raiyats.

A Bihia sugar mill was placed by this Department at the disposal of the Reverend Mr. Graham of Kalimpong for use by tenants of the Kalimpong Government estate. It is reported that the mill has become very popular, and is likely to lead to an extension of sugarcane cultivation.

A three-roller Bihia mill was obtained by my Assistant, Mr. Banerjei, for the Malighati estate in Midnapore, where the juice was not properly extracted by the local mills in use. The Manager speaks highly of the mill, which he says extracts double the quantity of juice ordinarily extracted by the two roller mills used in the estate.

A three roller Bihia mill and evaporating iron pan which were supplied to the Manager of the Madhupur estate in Cuttack were purchased by the raiyats of the estate, who are reported to appreciate them. Besides the Bihia sugar mill purchased in the previous year, a second mill was imported last year. Both were let out to tenants on hire, and their hire brought in a sum of Rs. 74-5-9. They are reported to be much appreciated by the raiyats.

MANUFACTURE OF DATE SUGAR.

44. Previous experiments having shown that unlike cane sugar, date *gur*, even of the best quality available in the market, could not be successfully dealt with by the sugar turbine (otherwise called the centrifugal sugar-drier), an attempt was made during the year to ascertain if good *gur* could be prepared from date juice, by proper care in boiling the juice by the substitution of deep earthen pans for the shallow iron pans which have come into use in Bihar. The attempt proved very successful, as the *gur* thus made was judged to be of an exceptionally fine quality by competent persons, and on being treated with the sugar turbine yielded almost pure white sugar and of better quality than the best kinds of date *dalua* sugar produced in Jessore.

The result was so promising that it is intended to try the method of sugar manufacture on a larger scale in the coming season.

APPLICATIONS FOR PATENTS.

45. Thirty-two applications for patents of an agricultural character were received during the year under report from the Government of India in the Revenue and Agricultural Department, and opinions of experts were obtained upon them. Of these sixteen were applications for patents connected with the tea industry, and were sent to the Secretary to the Indian Tea Association for opinion, together with the fee paid by the applicant for an expert's opinion. Five were applications for patents connected with the indigo industry, and were sent to the Secretary, Indigo Planters' Association, and to Mr. T. Barclay, Manager of the Motihari Indigo Concern. The remaining eleven applications were for patents connected with the cleaning of grains, seeds, &c. These were sent to the Secretary, Agri-Horticultural Society of India, who obtained the opinion of Mr. A. Parry, member of the Institute of Civil Engineers, on the inventions.

AGRICULTURAL EXHIBITIONS.

46. During the year 1892-93, agricultural exhibitions held at places noted in the margin received grants from this Department. Besides these, exhibitions were also held at Pabna and Faridpur, to which no Government subsidy was given. Both my Assistants, Messrs. Bhupal Chandra Basu and Nagendra Nath Banerjei, were present at the exhibitions at Dumraon and Cossipore. Mr. Basu was also present at Kurseong and Kalimpong, and Mr. Banerjei attended the Kushtia and Khulna exhibitions. Several agricultural implements and products were exhibited by them, and the working of the implements was explained to visitors. A silk section was added by Mr. Nitya Gopal Mukerji to the Cossipore, Khulna, Kalimpong, Faridpur and Pabna Exhibitions, where arrangements were made to illustrate the life-history of silk-worms, and to show the process of reeling cocoons.

Name of exhibition.	Amount of grant, Rs.
Dumraon ...	400
Cossipore ...	250
Kushtia ...	250
Khulna ...	250
Kurseong ...	100
Kalimpong ...	200

The Dumraon Exhibition, promoted by the Maharaja of Dumraon, was the third of its kind held in the Dumraon Raj. The Collector of Shahabad, Mr. F. H. Skrine, took great interest in this exhibition. The show was divided into five departments, viz., (*a*) live-stock, (*b*) agricultural implements and machinery, (*c*) agricultural produce, (*d*) garden produce, (*e*) manufactures, the third department consisting of agricultural produce, being its most interesting feature. Every species of grains and seeds was well represented, the entries being so numerous that difficulty was felt in finding room for them. Although poor in live-stock and several important products, such as sugar and dairy produce, the show was on the whole considered to be successful. Prizes were liberally awarded, amounting altogether to Rs. 797 in cash, and 29 medals of the value of Rs. 10 each. This Department exhibited dairy machines and dairy products, a maize-sheller, some ploughs and hoes, and some agricultural products, and secured two medals and four money prizes. In order to add interest to the exhibition, the Economic Museum at Bhojpur in Dumraon, containing selected specimens of seeds of the principal crops grown in India, of agricultural tools and implements, and of numerous economic products, such as fibres, dyes, spices, native drugs, &c., was removed to the exhibition grounds, and formed a great centre of attraction to the visitors.

The Cossipore Show is an annual exhibition, which was held for the first time four years ago. The officers of this department exhibited at this show the working of the sugar turbine, the three-roller Bihia sugar mill, the centrifugal separator, English butter churn, and the maize-sheller, which excited a great deal of interest among the visitors. Many of these implements and machines were also shown at work at Kushtia, Khulna, Kurseong, and Kalimpong. The Kushtia Exhibition, which was formally opened by the District Judge of Nadia, was very successful in spite of the unseasonable weather which prevailed at the time. A very large number of cultivators attended the exhibition from

different parts of the district, and competed for the prizes awarded for the best specimens of agricultural products. A distinct feature of this exhibition, as well as of the exhibition at Khulna, was the encouragement given to the cultivation of Naini Tal potatoes by the award of special medals. Much interest was excited in the competition for these medals, and it is hoped that the impetus thus given will lead to the introduction and cultivation of Naini Tal potatoes on a large scale in these two districts. A second interesting feature in the Khulna show was the exhibition of a patent paddy-husking machine by a Bengali, which worked very satisfactorily, and is likely to prove useful to raiyats.

The Kurseong Exhibition was poor both in respect of the number and quality of the exhibits. Horses, ponies, and poultry were fairly well represented, but in the important classes of agricultural produce, as well as in manufactures, the exhibits were few in number and of a commonplace character. The Kalimpong Exhibition, which was the second of its kind, showed a falling off under live-stock of all kinds, and also under grains. The falling off in live-stock was mainly due to *rinderpest*, which was raging at the time in all the surrounding hills, and the decrease in grain exhibits was due to the time of the year when the exhibition was held, which was a little too early for grains like rice and *marua*.

Advantage was taken of all these exhibitions to distribute pamphlets, both in English and the vernacular, on the results of agricultural experiments, on improved methods of cultivation, on the use of manures and improved implements. These notes were prepared by the officers of this Department.

SUPPLY OF SEEDS, IMPLEMENTS AND MANURES.

47. One of the duties of the Department is to supply seeds for experimental cultivation, manures and implements. The statement given below shows the distribution made last year:—

Article.	Number of persons supplied.*	Quantity.
Seeds—		Mds. S. CH.
Potatoes	23	181 33 0
Maize	2	2 5 0
Sorghum	3	1 25 0
Tobacco	4	0 0 8
Cotton (American)	4	1 10 0
Reana	3	0 10 8
Oats	7	12 18 0
Gram	1	3 0 0
Wheat	33	140 34 0
Barley	1	3 0 0
Paddy	2	0 20 0
Sisu	1	0 5 0
Saguan	1	0 5 0
Groundnut	1	0 20 0
Lucerne	1	0 0 8
Cabbage	1	0 0 8
		K. P.
Sugarcane cuttings	6	44 14
		Rs. A. P.
Vegetable seeds		8 7 0
Implements—		No.
Sugarcane mill	4	4
Evaporating pan	3	3
Maize-sheller	1	1
American hoes	1	2
Sibpur ploughs	5	11
Winnowing machine	1	1
Iron mortar	1	1
Manures—		Mds. S. CH.
Bonemeal	2	50 0 0
Saltpetre	2	1 35 0
Castor-cake	2	12 15 0

* Exclusive of experimental farms.

The Department also received and replied to numerous enquiries about various matters relating to agriculture. The seeds, implements and manures supplied were in most cases paid for.

COST OF AGRICULTURAL EXPERIMENTS.

	Rs.	A.	P.
Maintenance of Sibpur Farm	2,979	0	7
Miscellaneous experiments conducted by the Director's assistants, Messrs. Basu and Banerjei, and contingencies	2,405	1	7
Purchase of implements	559	1	0
Pay of agricultural overseers and travelling allowance ...	1,607	14	6
Collection of native implements	422	4	6
Purchase of bullocks for the Burdwan Farm	147	7	0
Expenditure of Director's office, freight, &c., of a bull from Hissar	57	6	3
Purchase of two pigs for Sikkim	200	0	0
Purchase, freight, &c., of wheat seed	674	15	0
Purchase of miscellaneous seeds, &c.	311	4	9
Grant to the Alipore silkworm-rearing experiments ...	500	0	0
Total ...	9,864	7	2

48. The total net cost to Government of agricultural experiments and enquiries conducted under the supervision of the Agricultural Department during the year, inclusive of the cost of implements and seed grain, &c., was Rs. 9,864-7-2.

EXPERIMENTS MADE BY MEMBERS OF THE AGRI-HORTICULTURAL SOCIETY OF INDIA.

49. The Society's report, except the notice of the silkworm rearing experiments printed in paragraph 17, has not been received.

50. This department continues to be indebted to the Calcutta Chamber of Commerce and to the Agri-Horticultural Society of India for their cordial assistance in all matters referred to them for help and advice.

CHAPTER V.

BENGAL VETERINARY INSTITUTION: CATTLE BREEDING.

51. In the Annual Report of this department for the year ending 31st March 1892, it was stated that the scheme for the establishment of the Bengal Veterinary Institution had been successfully developed with the assistance of munificent contribution from Babu Sheo Baksh Bagla and Sir Dinshaw Manockjee Petit. On the 31st May 1892, Veterinary Captain W. D. Gunn was appointed to be Superintendent of the Civil Veterinary Department of Bengal. Captain Gunn will have charge of the Veterinary Institution when it is opened. He reports that during the first-half of the official year the greater part of his time was utilised in thoroughly examining all the large stables in Calcutta, particularly with regard to the construction of the various floorings and roofs, so that the best possible stables may be secured for the Bengal Veterinary Institution. With the help of Mr. W. B. Gwyther, Under-Secretary to the Government, and member of the Committee of Management of the Veterinary Institution, plans for the Bengal Veterinary Institution were drawn up which were approved by the Inspector-General of the Civil Veterinary Department and by Government.

The buildings of the school and hospital of the Institution are now making rapid progress, and it is hoped that they will be ready for occupation in August or September. The school will have accommodation for 50 students, who will undergo a thoroughly practical course of instruction in equine and bovine pathology.

In the latter part of the year Captain Gunn paid visits to a number of districts, and explained to District Boards the object of the Bengal Veterinary Institution and the class of students that is required. He reports that the District Boards were much interested in various suggestions which he made for improvement of the breeds of cattle, particularly with regard to the size and class of bulls required. For instance, it was pointed out that a big Mysore or Hissar bull was not at all suitable for plough cattle of Bengal, a cross with a stout Burman bull being advisable. Up-country Burman cattle receive

the whole of the cow's milk, and are therefore all better nourished as calves than Indian cattle, the result being that the Burman bull is low, sturdy and powerful, and just suited for breeding plough cattle. For draught cattle a much larger bull is required. Captain Gunn considers that benefit will undoubtedly be derived from the importation of new blood, even if the bulls are not quite up to the required standard, as continued in-breeding must tend to degeneration.

The Calcutta Pinjrapole was frequently visited by Captain Gunn, and the Raneegunge Pinjrapole was also visited. Rinderpest in a very virulent form broke out, or was imported into the former place, but happily by stringent and energetic measures the epidemic was at once repressed. A recommendation was made to the Committee of the Pinjrapole that an intelligent veterinary assistant should be placed in charge of the establishment at Sodepur, so that cases of contagious diseases may be detected at once. The cases would then be reported to the Civil Veterinary Department, and proper measures would be adopted for their repression. The sick and surgical cases admitted into the institution likewise urgently called for skillful treatment. Captain Gunn reports that the Pinjrapole Committee very willingly adopted the recommendations made, and he speaks highly of the Sodepur Pinjrapole as a charitable institution, where sick and old animals are admitted, fed and carefully treated.

At the end of the year draft rules for the management of the Veterinary School, &c., were also prepared by Captain Gunn, and revised by the Committee of Management, and were submitted to Government for approval. Captain Gunn's report for the year is printed as an appendix to this Report.

CATTLE BREEDING.

52. The Hissar bull supplied to the Superintendent of the Nadia Jail, which was reported to be of little use in the last Annual Report, served 19 cows during the year under review, all of which are now with calf. Four calves born in the jail are reported to be good animals. The bull of the same breed at the Dacca Jail served 10 cows during the year. The Superintendent of the Jail remarks that it is too early yet to distinguish any improvement in the stock over ordinary country cattle. The Superintendent of Tippera Jail reports that the Hissar bull supplied to him served 18 cows during the year. Three of these, which belonged to the jail, have produced good calves. The Hissar bull supplied to the Deputy Commissioner of Manbhum was made over to the Midnapore Jail in December 1891 for breeding purposes. The Superintendent of the Jail reports that the bull served 35 cows during the year. The stock obtained are inferior to their sire in size and appearance. At the Bhagalpur Jail 21 jail cows and 9 outside cows were served by a Hissar bull. The stock, it is reported, show a great improvement on the country breed of cattle, being larger sized and possessing more bone and shape. The three Hissar bulls maintained on the Government estates at Nasriganj, Arrah and Buxar are reported to be very popular, and to have got stock much better than the local breed. The English bull supplied to the Arrah Municipality served 29 cows during the year, of which 10 have calved. All the calves, with the exception of three, are said to be very fine animals. Of the two Bachour bulls supplied from Darbhanga to the Settlement Officer of the Western Duars, one died, and the other, which was kept in charge of a jotdar of Mainaguri, was not found useful.

CHAPTER VI.

OFFICERS OF THE DEPARTMENT.

53. During the year under report the Director continued to have three Agricultural Assistants, viz., Mr. Nitya Gopal Mukerji, Mr. Bhupal Chandra Basu, and Mr. Nagendra Nath Banerjei, who are all graduates of the Royal Agricultural College of Cirencester. Mr. Mukerji was appointed to the Subordinate Executive Service in April 1889. Mr. Basu and Mr. Banerjei, who have worked under the Director since 1888, were appointed to the Subordinate Executive Service in January 1893. Mr. Mukerji was employed during the whole year in combating silkworm disease and in rearing

healthy seed. Mr. Basu and Mr. Banerjei had charge of the Sibpur, Dumraon and Burdwan Experimental Farms (an account of the operations on which is given in Chapter IV of this Report), and also had charge of experiments made on Government and Wards' estates (see paragraphs 24 to 39). They also gave valuable assistance to the Director in compilation of agricultural statistics. I desire especially to bring to the notice of Government the excellent work which has been done in compilation of agricultural statistics during the year by Mr. Basu. I have found his work thoroughly accurate and good; and his great intelligence and knowledge of agriculture in this country and other countries well qualify him to advise on agricultural subjects.

I have the honour to be,

SIR,

Your most obedient servant,

W. C. MACPHERSON,

Offg. Director of the Department of Land Records and Agriculture, Bengal.

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APPENDIX A.

No. 14, dated Berhampore, the 28th April 1893.

From—Babu Nitya Gopal Mukerji, Deputy Collector, on special duty,
To—The Director of the Dept. of Land Records and Agriculture, Bengal.

If the enclosed annual report for the silk experiments is printed, may I request the favour of your kindly sending 50 copies of it to the Secretary to the Zamindari Panchayat, 50 copies to the Secretary to the Silk Committee, and two copies each to the Collectors of Malda, Rajshahi, Bogra, Birbhum, Murshidabad, Nadia, and Midnapore.

2. I have the honour, as requested, to enclose a few lines suitable for your annual report.

No. 11, dated Berhampore, the 25th April 1893.

From—Babu Nitya Gopal Mukerji, Deputy Collector, on special duty,
To—The Director of the Department of Land Records and Agriculture, Bengal.

I have the honour to submit my report of the silk experiments conducted in 1892-93.

2. In statement (*a*) will be found a general summary of results. The experimental seed had about 1,000 trials in the silk districts during the year. Failure has taken place only in seven cases, in three cases from pebrine, in three cases from muscardine, and in one case from grasserie. Failure from pebrine and muscardine was in each case due to local infection, silkworms from inferior seed being reared in the same room at the same time, or immediately before, in each of these cases. The failure from grasserie in one case took place last February at a time when unusually heavy rains fell. This failure cannot be avoided while the use of Bengal shrub mulberry prevails. With the healthy seed, each rearer now receives a copy of instructions regarding all the silkworm diseases. When each rearer will use the experimental seed and follow out those instructions regarding disinfection and use of tree mulberry leaf, failure will be still more rare. In two cases the seed got spoilt in transit. Two small quantities of seed were also received at a time from the out-stations, when there happened to be no demand for seed. These four lots of seed are not included in column V, statement (*a*) Generally speaking, however, there was more demand for seed throughout the year than could be met. If requests for seed are obtained at least two months before it is required, satisfactory arrangements can be made for distributing larger quantities of experimental seed. This can be done only if the co-operation of silk factors and zamindars is obtained, as the poor raiyat is not accustomed to looking ahead. He goes out for seed when he actually wants it. The Bengal silkworm eggs hatching in 8 to 12 days after they are layed, it is very necessary that the seed should be despatched as soon as it is ready. Previous arrangement is therefore very important.

Summary of results.

3. Some assistance was received from Mr. B. Walton of the Kajla Factory (Rajshahi) and Mr. Ferguson of Berhampore in the matter of distribution of healthy seed, and Mr. C. W. Marshall of the Gunutia Factory (Birbhum), continued to support the experiment not only by distributing my seed, but also by popularising the use of sulphur against muscardine. But the bulk of the seed was sold retail to cultivators direct.

Co-operation of silk factors.

4. Although the experimental seed had only about 1,000 trials during the year, the indirect result of the experiments has already been felt in most parts of the silk districts in the shape of healthier and larger crops. A very large quantity of healthy seed is now in circulation throughout the silk districts, as the crops raised in the silk districts from the experimental seed are eagerly used in their turn again for seed. Each man's crop may be used for seed by 100 men, and if only 1,000 men receive the experimental seed and rear it according to the printed instructions they receive with the seed, their crops will serve as second-rate seed for 100,000 men. I am aware that every man's crop from the experimental seed was not taken up for seed during the past year, but facts are decidedly tending that way.

Indirect result.

5. As in the previous year, seed was raised in the year under report at Kalimpong, Pakhuria and Khulna. Two new stations were added during the year,—one at Balukhali in the Magura subdivision of Jessore, and the other at Kagacheria in Malda at the extreme north-west corner of the silk districts. A grant of Rs. 250 was made to the Reverend A. Campbell of Pakhuria, and to the Reverend J. A. Graham of Kalimpong, for conducting the experiments at Pakhuria and Kalimpong. These sums were spent by these gentlemen in maintaining the mulberry nurseries, distributing plants and encouraging rearing of cocoons. A further grant of Rs. 150 was made to the Reverend J. A. Graham for building a rearing house at Kalimpong. Khulna was managed directly, and no lump grant was made to any local gentleman for looking after the experiments in this station. The two new stations are conducted independently, only a microscope and some cleaning nets being lent to each. The history of these two new stations is interesting, and will be given below. A

The seed rearing stations.

mulberry nursery was made at Gobindpur in Manbhum, and about 400 grown up plants were distributed from this nursery during the year. About 450 plants were distributed from the Pakhuria nursery, 1,500 plants were distributed from the Khulna nursery, and 300 plants from the Kalimpong nursery. No additions were made (except in the new station at Balukhali) in the areas under Bengal mulberry or under tree-mulberry plants during the year.

A seed rearing village.

6. In paragraph 9 of my last year's report and in other correspondence the importance of having seed-rearing villages in isolated localities in the silk districts, was explained. Such a seed-rearing village was established during the year at Kagacheria in Malda. The experimental seed has been in use in the villages adjoining the postal towns of Araidanga, Nemasarai and Kaliachak for nearly two years. It gave such great satisfaction that it evoked the curiosity of three silk rearers—one belonging to the village Jot near Nemasarai, another to Sujapur near Kaliachak, and the third to Kagacheria near Araidanga—to learn new methods. Of these three, Danda Dhar Das of Kagacheria was alone encouraged to learn the methods and to establish a seed-rearing nursery at Kagacheria, this village being situated at an isolated locality in the outskirts of the silk districts. Danda Dhar war trained at Berhampore, and a microscope and other special appliances were lent to him when he began work in his village last November. His November crop was a remarkable success, but there was no demand for this crop for seed in his own village, where only the fame of his first crop spread. He sold this crop to filatures for Rs. 425. His next crop was bought up only wholly for seed last February in his own village, and also by outsiders for Rs. 493. His third crop, raised in March, was sold for Rs. 960, of which Rs. 800 was realised by sale of seed only. Every silk rearer in this village has been imitating Danda Dhar's methods as much as possible, and using the experimental seed. The use of sulphate of copper wash and of sulphur fumigation has been resorted to by all the silkworm rearers of Kagacheria, and the whole village has come to be recognised as a seed-rearing village.

Balukhali.

7. At Balukhali the seed rearing was begun in this way: Babu Peary Mohan Guha, the leading pleader of the Jessore Bar, watched with great interest the progress of the silk experiments at Khulna, and resolved to introduce the silk industry in his newly-acquired property of Balukhali. He took away 1,200 mulberry plants and cuttings for 3 bighas of Bengal mulberry from Khulna last August. A crop of silkworms was reared successfully at Balukhali in January. This was sold for Rs. 70 to the silk-rearers near Gunutia Factory, who used it for seed for the March crop, and obtained most satisfactory result. Two local men—Nibaran and Hementa, —were trained in microscopic selection of seed, but they do not seem to be in the employ of the Balukhali estate at present. A microscope has been also lent for this experiment, but if it is not used the experiment is sure to fail.

The Alipur silk experiments.

8. The Alipur silk experiments were conducted by the Silk Committee under the immediate supervision of Babu Apurba Coomar Ghose, a man trained in my establishment at Berhampore. Pasteur's method was adopted in the Alipur experiments during the year, but from a Bengal Circular issued by Apurba Babu for the edification of village rearers, it seems he is determined upon causing flacherie among Bengal silkworms, an ill almost unknown in the November and March bunds and easily avoided even in the rains. It is usual to feed silkworms three or four times a day. Following the wake of some experimentalists, Apurba Babu has been feeding his silkworms 12, 24, and even 48 times a day. If silkworm rearing is to be carried on in practice, and not followed as a mere pastime, it will never pay giving them 12 or 24 feeds per day. What is called liberal feeding is again one of the chief causes of flacherie, and twelve feeds a day is too absurdly liberal. In a controversy with Mr. J. A. Anderson, the Secretary to the Silk Committee, I pointed out that either "dust or liberal feeding" must be giving rise to flacherie in the Alipur experiments. (The *Englishman*, 20th January 1893.) From Apurba Babu's Bengali Circular received from Mr. Anderson this month, I am convinced of the source of flacherie at Alipur to be over-feeding. In this opinion I am further confirmed by a report brought by my Assistant from Bhogpur and Pathanpara near Gunutia Factory, where this last March bund saw failure of the Alipur seed from flacherie, though my seed in both these villages succeeded so well in this same bund that a portion of the crop was bought up by other villagers for seed. It is a most unusual thing in Bengal for flacherie to be observed in the March bund, and I have no hesitation in attributing it entirely to the system of twelve feeds per diem followed in the Alipur experiments.

The Sulphate of Copper bath.

9. With reference to the controversy with Mr. Anderson already referred to, a doubt was expressed as to the efficacy of the sulphate of copper bath in relation to flacherie, referred to in paragraph 12 (2) of my last year's report. During the year under report a remarkable confirmation of the result of the previous year's experiment on this point took place. Mr. B. Walton of Kajla Factory indented for a quantity of Deshi seed for the last November bund. He subsequently wrote that he wanted the seed to hatch on the second or third of November. This information was received rather late during the rearing season at Pakhuria. It was only by keeping the Pakhuria worms at an unnaturally high temperature that I could get the eggs from that crop to hatch on the second or third of November. If I left the worms at the normal temperature, the hatching would have taken place a week later. It is very important, however, that worms in the same village should all hatch and spin simultaneously. If in some of the houses the worms spin a week later than in the others, the parasitic flies concentrate their attack on the former and ruin the crop. I had thus to force the October crop at Pakhuria even at the risk of getting

flacherie among my worms nearly a fourth part of the worms died with flacherie under this unnatural treatment. According to a Pasteur the crop should have been rejected for seed. But I had found in my previous year's experiments that it was perfectly safe using eggs from a crop effected with flacherie, provided it was fairly exempt from pebrine, and provided also the eggs were washed with sulphate of copper solution. The Pakhuria eggs were therefore sent after the wash to Mr. Walton without any hesitation. In reporting the result from this seed in his letter dated 8th December 1892, Mr. Walton wrote: "The Deshi seed you sent me from the Aghran *bund* has turned out a great success;" so there was no failure from flacherie. It could not have been a mere accidental case of success, as Mr. Walton bought Rs. 100 worth of seed for that bund, and it was probably used in about 100 different houses.

The mulberry parasite.

10. A very useful experiment was carried out successfully during the year. It was discovered that the mulberry disease locally known as *turka*, which did such universal damage from January to July to the mulberry crop in Bengal, was caused by a minute *coccinae* insect, probably a Diaspis. Kerosine emulsion was applied successfully to a plot of 12 bighas of mulberry last November This field used to be annually attacked by *turka* in common with all the neighbouring fields; but this year it is the only field exempt from it. An account of this and other insect parasites that came within my observation last year has been submitted separately in my No. 309, dated the 22nd March 1893.

Ficus religiosa.

11. The experiment alluded to in paragraph 12 (8) of my last annual report was repeated during the year. It was found that all kinds of mulberry silkworms could be reared only until the fourth moult on the common *peepul* or *Ficus Religiosa*, provided very tender leaf alone was used. After the fourth moult the worms must be fed on mulberry, else they die altogether or spin very flimsy cocoons.

The introduction of European cocoons.

12. I regret to report that this experiment resulted in almost total failure at Kalimpong in April and May 1892. The eggs hybernated at Gnatong hatched very irregularly, and the microscopic examination of the moths that subsequently came out from the cocoons reared at Kalimpong showed every specimen affected with pebrine or pebrine and flacherie together. As all the different varieties of worms were incubated in one small room before they were distributed to villages, they all got infected more or less, and the whole of the Kalimpong crop was rejected for seed purpose. If the mismanagement of the Kalimpong crop in 1891 is recalled, it can be easily understood how it was that the European seed used there in 1892 (which was the produce of the crop reared in April and May 1891) proved so bad. Though Gnatong is a cold enough place for hybernation, a mistake was made at Kalimpong in packing up the seed before it was sent up to Gnatong. Instead of leaving three-quarters of the packing case empty, seed was packed tightly in it. This must have given rise to heating which counteracted the action of cold. For the present year's experiment fresh seed had to be imported from Italy. This was hybernated at the powder Magazine at Jalapahar (Darjeeling, and I am glad to report the hatching of this seed was even and complete, and the next Kalimpong crop should be a perfect success. The seed hybernated at Jalapahar hatching so satisfactorily opens out great possibilities for improving the quality of the Bengal silk by the introduction of a high class cocoon. The difficulty has always been uneven hatching of European silkworm eggs in this country, which can be avoided by properly hybernating the seed. Hybernated European seed can be sent down by post from Darjeeling and distributed through silk factors and zamindars to cocoon-rearers in the month of February, so that a *March bund* of European cocoons may be obtained in Bengal. Last January some European silkworms were obtained from Mr. E. C. Cotes of the Indian Museum, and from Mr. J. A. Anderson, the Secretary to the Silk Committee. These reared with the ordinary Bengal mulberry produced cocoons equal to the best Italian cocoons. A sample of these cocoons was sent to Messrs. Lyall, Gallois and Ferguson of Berhampore for inspection, and these gentlemen have promised to help the experiment of introducing European cocoons among Bengal cocoon-rearers.

White Erindi cocoons.

13. The experiment in selecting out the lightest coloured *Atacus ricini* (Eria or Erindi) cocoons has resulted in almost a perfectly white stock. This stock being free from disease (and the Assam cocoons being very much diseased) attempt is being made to introduce this stock in Assam and Bogra.

The Kashmir silk experiments.

14. The silk experiment in Kashmir being still directed by my advice, and the person in immediate charge of these experiments having been trained at Berhampore, it will not be out of place to give here a short account of the progress of these experiments since my visit to Kashmir in 1890. Experiments with the object of recuscitating the fallen silk industry of Kashmir were initiated in 1890. Work was commenced that year with imported seed. Very good result was obtained, but the experiment being initiated on a small scale, the expenses exceeded the income by Rs. 2,956-6-9. In the second year (1891-92), through an unfortunate mistake,—the trained men from Berhampare having come home on leave,—the eggs got heated and nearly the whole of the crop perished through flacherie. The year the expenses exceeded the income by Rs. 3,014-14-3. In the third year (1892-93) fresh seed had to be used, a portion of it being sent from Bengal. The Bengal seed gave the best result of all. Great mismanagement, however, took place on account of cholera breaking out at the silk-rearing season. The income this year exceeded the expense by Rs. 1,260. For the present

year's experiment some seed has been imported again from Europe and Bengal. I do not expect good results (except from the Bengal and the cellular Kashmir seeds) from the present season's operations in Kashmir, as the imported seed arrived too late, and as the industrial Kashmir seed has too high a proportion of pebrine in it. Lest the result from the application of Pasteur's method in Kashmir should be considered disappointing, it is best to point out that it has not had the chance of being applied in practice in Kashmir. The seed imported must always be assumed to be industrial seed, though it always professes to be 'cellular,' selected by the rigorous application of Pasteur's system. The 'cellular seed' proper must be obtained by patient selection in Kashmir, and it is this alone that must be depended upon as the basis of 'industrial seed' proper. In the anxiety to obtain a large result, the importance of selecting out a perfect stock has been somewhat lost sight of in Kashmir.

The Nepaul silk experiments.

15. In April 1892 the Nepaul Government secured the services of an educated man trained in my establishment at Berhampore to introduce sericulture at Bysabaree near Siliguri in the Nepaul Terai. Four crops of silkworms were reared most successfully during the year, after which the Berhampore man found Bysabaree too unhealthy and abandoned the experiments against the wishes of the authorities. The experiments, I understand, are still being carried on; but I do not think a foundation solid enough has been laid for the experiments to succeed in the long run.

Silk experiments in Baroda.

16. In the Native State of Baroda, also, silk experiments have been initiated by Mr. Kusherao Jadava of Cirencester College. But as frequent requests for seed are received, I presume they have not met with success.

Silk experiments in Hyderabad.

17. Mr. Yashwantrao Sheshadri, also of Cirencester College and a native of Hyderabad, paid Berhampore a visit last September with the object of instituting silk experiments at Jalna. Mr. Sheshadri has since planted mulberry, and he has been familiaring himself with silk-rearing by taking small crops of the Eria cocoons.

Silk experiments in Madras.

18. Mr. Venkatram, an agricultural student of South Canara, has been carrying on silk experiments for a number of years in the Madras Presidency. In his letter dated the 18th March he speaks about coming to Berhampore to be trained in Pasteur's system. In this he should be encouraged, if the silk experiments in Madras are continued.

Silk experiment at Sialkot.

19. A Bengali gentleman had been carrying on silk experiments unsuccessfully for a numbers of years at Sialkot. As large mulberry trees abound in the Punjab, it was considered important to demonstrate how easy it was to rear silkworms successully with good seed. I sent my Assistant to Sialkot last year, and he took a successful crop in April. I have heard of no endeavour to continue the experiments this year.

Silk experiments in Moradabad.

20. Rai Sheo Narain of Amraha (Moradabad began silk experiments only last months. He has had a successful crop of cocoons, and I am at present in correspondence with him regarding the employment of a trained man for carrying on the experiments.

Silk experiments at Burdwan and Cossipore.

21. The silk section of the Cossipore Agricultural show attracted the attention of the authorities of the Burdwan Raj estate, and they have been carrying on experiments on a small scale successfully at Burdwan since last February. There is now a definite proposal to carry on the experiments systematically by employing a trained man. Raja Banbehary Kapur has interested himself, especially in the introduction of European cocoons, among the silk-rearing raiyats of the estate. Babu Hem Chandra Mitter, the proprietor of the Cossipore Practical Institution, has also added silk experiments to his programme of instructions. It is much to be desired that he should make some arrangement for the systematic instruction of students in this branch of study, as the students of his institution find ready employment and prove very useful men.

Other hopeful spheres.

22. If zamindars interest themselves in silk experiments, a new and lucrative industry can be introduced among peasants in all those localities where large mulberry trees already exist. In many parts of Bihar and the sub-Himalayan rigions, in many parts of the Punjab and the North-Western Provinces, large mulberry trees abound. In some parts of the Lower Provinces, also, *e.g.*, at Bongong and at Dattapukur, there are considerable number of mulberry trees at present standing neglected. Zamindars by getting persons trained at Berhampore may help the introduction of the silk industry among their raiyats.

Training of apprentices.

23. A Lepcha was trained during the year, and he has been put in charge of the Kalimpong experiments. He will be employed by Mr. Graham in training boys and girls in silk-rearing, in reeling of whole cocoons and spinning of pierced cocoons, after the present crop is over. A Sonthal is also in training at Berhampore for the Pakhuria experiments, but he is rather slow, and it will take probably another year before he can reel and spin silk sufficiently well to be of use in his own country. The Buna who is in charge of the Khulna experiments has had only occasional training during the last two years, but as I have found no one at Khulna interested in the experiments in the same way as Mr. Campbell or Mr. Graham, it has been found necessary to leave this apprentice constantly at Khulna to protect the mulberry. He can do the microscopic selection of seed satisfactorily, but has not learnt reeling and spinning sufficiently well. At Balukhali two local men were trained only in rearing and microscopic work.

Exhibitions.

24. A silk section was added to the Kalimpong, Faridpur, Cossipur, Khulna and Pabna Agricultural exhibitions. Murshidabad silk-weavers were induced to send the products of their loom to the last four exhibitions. These were eagerly bought up by people; more than Rs. 1,600 worth of silk articles being sold at the four shows. Considerable impetus has been given to the Jangipur silk-weaving industry by means of these shows, and the vitality of this industry fully demonstrated. Papers were also contributed to the journal of the Society for the promotion of Indian Industries with the object of bringing the claims of the silk industry to the notice of zamindars.

Tours.

25. The programme of tours followed during the year will be seen in statement (*b*).

Recommendation regarding the future conduct of the experiments.

26. The experiments have now reached a stage when they require to be extended in their sphere of operation. There are now four centres of work in places where the silk industry had been unknown before. There is the immediate possibility of founding other such centres if resources are forthcoming. There is now only one seed-rearing village in an isolated locality in the silk districts. There are many such isolated localities in Birbhum, in Bogra, in Howrah and in Nadia, where seed-rearing villages may be established if resources are forthcoming. It is possible the zamindars concerned will get men trained at their own expense and help the establishment of new centres of work in the silk districts and out of the silk districts. But it is just as likely that the zamindars will not come forward. With the resources at present available, nothing can be done in the way of extending the experiments. Nominally Rs. 8,000 are set apart for the silk experiments, but out of this Rs. 6,000 have to be deducted on account of my pay and travelling allowance. It is difficult to maintain the experiments even on the present scale in efficiency with Rs. 2,000. On the other hand, I cannot recommend that Government should spend more than Rs. 8,000 per annum for the improvement of a single industry. I have no hesitation, however, in suggesting that it will be quite safe now putting the experiments in charge of an Inspector with a lower pay under a general kind of guidance from me. Whether I am employed in Criminal, Settlement or Agricultural work, it can be easily arranged that I should still retain the same control over the silk experiments and be responsible for their conduct without devoting much time for it. The silk experiments have now degenerated into buying and selling of 'seed,' checking the microscopic work of the rearers, and seeing that the rules definitely laid down for their guidance are carried out in each case. It is the interest of all these rearers to succeed, as they get the profits of the crop, and the duty of the Inspector will not be of a very onerous or responsible character.

Agricultural experiments.

27. A separate report will be submitted for the agricultural experiments conducted during the year under my supervision.

Planting of *Moras serrata*.

28. In concluding this report, I will again beg to invite your attention to the importance of propagating the *Moras serrata* in the Lower Provinces of Bengal, whether the trees are eventually utilised for silk rearing or not. The mulberry used in the silk districts of Bengal is an exotic compared to the *Moras serrata*. It grows wild from an elevation about 200 feet to that of 3,000 feet, while the native habitat of the Bengal mulberry of silk districts is at an elevation of above 3,000 feet. Some plants of the *Moras serrata* have been grown from seed at Berhampore, Khulna, and Balukhali. The seed was sown in August or September, and a few of the plants are already over 10 feet high. As a huge and ornamental tree, yielding excellent fodder and timber, it is eminently fitted for planting by road sides and on poor lands.

Statement (*a*).

Statement showing the progress of the Silk experiments in 1892-93.

Year.	Total expenditure for the year.	Expense for rearing only.	Cash receipts.	Quantity of healthy seed used.	Area maintained under Bengal mulberry in out-stations.	Area of nursery for propagating large trees.	Number of grown up mulberry plants distributed.	Remarks.
I	II	III	IV	V	VI	VII	VIII	IX
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Ozs.	Bgs.	Bgs.		
1891-92 ...	8,077 1 9	743 10 0	484 5 0	1,035	9	6	150	The sums entered under column IV represent only the amounts deposited at the Berhampore Treasury, and they do not include sales directly effected by the seed-rearing stations without my interference.
1892-93 ...	8,134 2 0	513 3 3	974 9 0	1,900	12	7	2,650	

STATEMENT (*b*).

Tours.

Date.	Number of days.	Places.	Object of tour.
1st April to 18th May 1892.	48	Kalimpong and neighbouring places.	To inspect rearing of a crop of silkworms.
19th to 29th July 1892 ...	11	Khulna and Calcutta ...	„ organise agricultural experiments, to distribute mulberry plants at Khulna and Balukhali, and to confer with the Director.
22nd to 24th August 1892	3	Ramnagar Factory ...	„ attend working of a European reeling machine.
3rd to 11th September 1892.	9	Bogra	„ organise a silkworm seed-rearing station.
18th September to 21st October 1892.	34	Pakhuria	„ inspect rearing of a crop of silkworms.
25th October 1892 ...	1	Murshidabad ...	„ organise agricultural experiments.
4th to 11th November 1892.	8	Kagacheria	„ establish a silkworm seed-rearing station.
22nd November 1892 ...	1	Kandi	„ inspect agricultural experiments.
1st December 1892 ...	1	Murshidabad ...	„ ditto ditto.
7th to 13th December 1892	7	Calcutta	„ confer with the Director.
14th December 1892 to 9th January 1893.	27	Khulna	„ inspect silk and agricultural experiments.
10th to 15th January 1893	6	Balukhali	„ establish a silk-rearing station.
16th to 19th January 1893	4	Calcutta	„ confer with the Director.
20th to 31st January 1893	12	Balukhali	„ inspect silk experiments.
1st to 6th February 1893	6	Cossipore	„ help in the Agricultural Show.
28th February 1893 ...	1	Murshidabad ...	„ inspect agricultural experiments.
12th March 1893 ...	1	Katgola Garden ...	„ arrange for the extermination of mango maggots.
26th to 31st March 1893...	6	Darjeeling	„ arrange for the incubation of Eurapean seed hybernated at Jalapahar.
Total ...	186		

APPENDIX B.

STATEMENTS RELATING TO THE BURDWAN FARM.

STATEMENT (*a*).

Manure experiments with fresh planted samshara canes.

Field number.	Area in cottahs.	Quantity of manure applied per acre.	Actual outturn.			Outturn per acre.			Cost of cultivation per acre.			Money value of gur and bye products per acre.	Gain or loss per acre.
			Sugarcane.	Juice.	Gur.	Sugarcane.	Juice.	Gur.	Price of manure.	Cultivation cost.	Total.		
		Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
16	5	Super ... 9 0 0 Saltpetre ... 3 6 0 Gypsum ... 3 0 0	49 0 0	25 0 0	4 10 0	588 0 0	300 0 0	51 0 0	48 0 0	144 12 0	192 12 0	229 8 0	+ 36 12 0
17	5	Bonemeal ... 13 8 0 Castor-cake 22 20 0	80 0 0	40 0 0	6 30 0	960 0 0	480 0 0	81 0 0	71 4 0	188 4 0	259 8 0	364 8 0	+105 0 0
18	5	Bonemeal ... 9 0 0 Super ... 3 0 0 Saltpetre ... 3 6 0	57 0 0	29 0 0	5 0 0	684 0 0	348 0 0	60 0 0	40 2 0	175 8 0	215 10 0	270 0 0	+ 54 6 0
19	5	Bonemeal ... 21 0 0 Saltpetre ... 3 0 0	51 0 0	26 0 0	4 20 0	612 0 0	312 0 0	54 0 0	54 6 0	164 4 0	218 10 0	241 0 0	+ 22 6 0
20	5	Bonemeal ... 24 0 0	49 0 0	25 23 0	4 15 0	588 0 0	306 36 0	52 20 0	45 0 0	158 4 0	203 4 0	236 4 0	+ 33 0 0
21	5	Castor-cake 42 0 0	75 0 0	39 0 0	6 25 0	900 0 0	468 0 0	79 20 0	84 0 0	195 15 0	279 15 0	357 12 0	+ 77 13 0
22	5	Ditto 11 30 0 Super ... 6 30 0	40 0 0	21 18 0	3 25 0	480 0 0	257 16 0	43 20 0	43 9 6	167 5 6	210 15 0	195 12 0	— 15 3 0
23	5	Cowdung ... 300 0 0	41 0 0	22 20 0	3 30 0	492 0 0	270 0 0	45 0 0	12 0 0	141 6 0	153 6 0	202 8 0	+ 49 2 0
11	2½	Unmanured	Failed to germinate.										

STATEMENT (*b*).

Ratooning experiments with khari canes.

Field number.	Area in cottahs.	Quantity of manure applied per acre.	Actual outturn.			Outturn per acre.			Cost of cultivation per acre.			Money value of gur and bye products per acre.	Gain or loss per acre.
			Canes.	Juice.	Gur.	Canes.	Juice.	Gur.	Price of manure.	Other expenditure.	Total.		
		Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
38	2½	Cowdung ... 300 0 0	37 30 0	19 15 0	3 39 8	906 0 0	465 0 0	95 4 0	12 0 0	117 0 0	129 0 0	478 8 0	+349 8 0
14	5	Super ... 6 24 0 Saltpetre ... 2 10 0	48 0 0	22 20 0	4 20 0	576 0 0	270 0 0	54 0 0	27 3 0	93 12 9	120 15 9	243 0 0	+122 0 3
15	5	Castor-cake 15 0 0 Mustard-cake 15 0 0	55 0 0	25 0 0	5 0 0	660 0 0	300 0 0	60 0 0	45 0 0	99 3 0	144 3 0	270 0 0	+125 13 0

Statement (*c*).

Results of trench planting and planting in shallow lines.

Field number.	Area in cottahs.	Quantity of manure applied per acre.	Actual outturn. Canes.	Actual outturn. Juice.	Actual outturn. Gur.	Outturn per acre. Canes.	Outturn per acre. Juice.	Outturn per acre. Gur.	Cost of cultivation per acre. Price of manure.	Cost of cultivation per acre. Other expenditure.	Cost of cultivation per acre. Total.	Money value of gur and bye products per acre.	Gain or loss per acre.
		Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
57	2½	Cowdung ... 300 0 0 Castor-cake 6 0 0	10 0 0	4 25 0	0 35 0	240 0 0	105 0 0	21 0 0	24 0 0	48 12 0	72 12 0	94 8 0	+ 21 12 0
58	2½	Cowdung ... 300 0 0 Castor-cake 6 0 0	6 0 0	2 20 0	0 20 0	144 0 0	60 0 0	12 0 0	24 0 0	39 12 0	63 12 0	67 8 0	+ 3 12 0
61(*a*)	10	Cowdung ... 300 0 0 Castor-cake 6 0 0	118 0 0	57 20 0	10 37 8	708 0 0	345 0 0	65 25 0	24 0 0	94 14 0	118 14 0	295 5 0	+176 7 0
61(*b*)	10	Cowdung ... 300 0 0 Castor-cake 6 0 0	59 0 0	27 20 0	5 10 0	354 0 0	165 0 0	31 20 0	24 0 0	60 0 0	84 0 0	142 2 0	+ 58 2 0

Statement (*d*).

Fodder grasses.

Field number.	Area in cottahs.	Name of grass.	Quantity of manure applied per acre.	Actual outturn.	Outturn per acre.	Cost of cultivation per acre. Price of manure.	Cost of cultivation per acre. Other expenditure.	Cost of cultivation per acre. Total.	Money value of outturn per acre.	Gain or loss per acre.
				Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
47*a*	4½	Sorghum ...	Bonemeal, 3 maunds	34 0 0	480 0 0	5 10 0	17 10 0	23 4 0	75 0 0	+51 12 0
47*b*	4½	Ditto ...	Unmanured ...	25 0 0	360 0 0	...	17 10 0	17 10 0	56 4 0	+38 10 0
48*a*	2	Reana ...	Ditto	5 0 0	150 0 0	...	20 2 6	20 2 6	23 7 0	+ 3 4 6
48*b*	2	Sorghum ...	Ditto	5 0 0	150 0 0	...	20 10 0	20 10 0	23 7 0	+ 2 13 0
48*d*	2	White cholum	Ditto	6 0 0	180 0 0	...	18 12 0	18 12 0	23 2 0	+ 9 6 0

Statement (*e*).

Manure experiments with jute.

Field number.	Area in cottahs.	Quantity of manure applied per acre.	Actual outturn. Plants.	Actual outturn. Fibre.	Outturn per acre. Plants.	Outturn per acre. Fibre.	Cost of cultivation per acre. Price of manure.	Cost of cultivation per acre. Other expenditure.	Cost of cultivation per acre. Total.	Money value of outturn per acre.	Gain or loss per acre.
			Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
55	9½	Castor-cake, 6 maunds ...	27 20 0	2 30 0	180 33 0	18 3 0	11 4 0	63 4 6	74 8 6	90 6 0	+15 13 6
56*a*	4½	Bonemeal, 3 ,, ...	10 20 0	1 2 0	148 9 5	14 32 14	5 10 0	54 11 3	60 5 3	74 1 9	+13 12 6
56*b*	6½	Cow-dung, 150 ,, ...	21 10 0	2 5 0	204 0 0	20 16 0	6 0 0	69 0 0	75 0 0	102 0 0	+27 0 0
56*c*	2½	Saltpetre, 30 seers ... Super, 1½ maunds ...	6 26 10	0 26 10	160 0 0	16 0 0	7 11 0	56 0 0	63 11 0	80 0 0	+16 5 0

Statement (*f*).

Manure experiments with aus *paddy.*

Field number.	Area in cottahs.	Quantity of manure applied per acre.	Actual outturn. Grain.	Actual outturn. Straw.	Outturn per acre. Grain.	Outturn per acre. Straw.	Cost of cultivation per acre. Price of manure.	Cost of cultivation per acre. Cost of cultivation.	Cost of cultivation per acre. Total.	Money value of outturn. per acre.	Gain or loss per acre.
		Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
2	6	Unmanured	2 16 0	2 20 0	24 0 0	24 39 15	...	15 15 0	15 15 0	54 3 9	+38 4 9
3	8½	Bonemeal ... 3 0 0	4 20 0	5 20 0	30 0 0	38 32 14	5 10 0	16 14 0	22 8 0	69 12 0	+47 4 0
4	5½	Cowdung ... 150 0 0	2 15 0	3 0 0	25 26 5	32 31 15	6 0 0	16 14 0	22 14 0	60 13 6	+37 15 6
5	10	Unmanured	3 20 0	3 20 0	21 0 0	21 0 0	...	14 14 6	14 14 6	48 0 0	+33 1 6
6	10	Bonemeal 3 0 0	5 20 0	6 0 0	33 0 0	36 0 0	5 10 0	15 0 0	20 10 0	75 0 0	+54 6 0
7	7	Saltpetre 0 30 0	3 30 0	4 15 0	30 0 0	37 20 0	3 12 0	15 15 0	19 11 0	69 12 0	+50 1 0
8	10	Unmanured	2 20 0	3 0 0	15 0 0	18 0 0	...	14 11 6	14 11 6	34 8 0	+19 12 6
9	10	Bonemeal 3 0 0	5 20 0	6 0 0	33 0 0	36 0 0	5 10 0	16 0 6	21 10 6	75 0	+53 5 5
10	6	Saltpetre 0 30 0	3 7 8	4 10 0	31 35 0	37 20 0	3 12 0	15 0 0	18 12 0	73 2 0	+54 6 0

Statement (*g*).

Manure experiments with winter paddy.

			Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
64	12½	Cowdung	150 0 0	9 3 12	12 0 0	45 0 0	59 15 4	6 0 0	20 2 3	26 2 3	105 0 0	+78 13 9
65	13½	Unmanured ...	.....	3 15 0	4 20 0	15 0 0	19 39 14	...	17 15 9	17 15 9	35 1 0	+17 1 3
66	13	Castor-cake ...	6 0 0	9 5 0	12 0 0	42 4 8	55 15 5	12 0 0	17 12 6	29 12 6	98 1 0	+68 4 6
67*b*	6½	Cowdung	150 0 0	4 39 2	6 16 8	44 10 0	57 0 0	6 0 0	22 10 9	28 10 9	102 9 0	+73 14 3
68*b*	7	Unmanured ...	.....	1 31 12	2 14 8	15 15 0	20 10 0	...	17 4 0	17 4 0	35 13 0	+18 9 0
69*b*	7½	Bonemeal	3 0 0	5 25 0	7 20 0	45 0 0	60 0 0	5 10 0	18 3 0	23 13 0	105 0 0	+81 3 0
70*b*	7	Bonemeal	3 0 0	5 17 0	7 0 0	46 20 0	60 0 0	5 10 0	18 7 6	24 1 6	108 0 0	+83 14 6
71*b*	7½	Unmanured ...	.....	2 10 0	3 30 0	18 0 0	30 0 0	...	16 4 0	16 4 0	43 8 0	+27 4 0
72*b*	8	Bonemeal ... Saltpetre	3 0 0 0 30 0	7 16 0	8 10 0	55 20 0	61 35 0	9 6 0	18 13 9	28 3 9	127 14 0	+99 10 3

Statement (*h*).

Experiments with fine and coarse paddy.

Field number.	Area in cottahs.	Name of paddy.	Quantity of manure applied per acre.	Actual outturn.		Outturn per acre.		Cost of cultivation per acre.			Money value of outturn per acre.	Gain or loss per acre.
				Grain.	Straw.	Grain.	Straw.	Price of manure.	Cost of cultivation.	Total.		
				Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
80*a*	10	Acclimatised, fine ...	Unmanured ...	3 0 0	4 20 0	18 0 0	27 0 0	...	13 11 0	13 11 0	54 0 0	+40 5 0
80*b*	10	Fresh seed ,, ...	Ditto ...	2 30 0	4 0 0	16 20 0	24 0 0	...	13 11 0	13 11 0	49 8 0	+35 13 0
83	14½	Coarse paddy	Ditto ...	5 36 0	7 20 0	24 16 8	31 1 4	...	17 9 3	17 9 3	55 8 3	+37 15 0

Statement (*i*).

Maize.

Field number.	Area in cottahs.	Name of variety.	Quantity of manure applied per acre.	Actual outturn.		Outturn per acre.		Cost of cultivation per acre.			Money value of outturn per acre.	Gain or loss per acre.
				Grain.	Stalk and leaf.	Grain.	Stalk and leaf.	Price of manure.	Other expenditure.	Total.		
				Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
53*a*	4½	Country ...	Bonemeal, 6 mds.	1 11 0	11 2 0	18 0 0	156 0 0	11 4 0	23 13 0	35 1 0	36 0 0	+0 15 0
53*b*	4½	Ditto ...	Unmanured ...	0 29 12	6 15 0	10 20 0	90 0 0	.....	23 13 0	23 13 0	21 0 0	—2 13 0

Statemdnt (*j*).

Manure experiments with Naini Tal potatoes.

Field number.	Area in cottahs.	Quantity of manure applied per acre.	Actual outturn.	Outturn per acre.	Cost of cultivation per acre.			Money value of outturn per acre.	Gain or loss per acre.
					Price of manure.	Other expenditure.	Total.		
			Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
44*a*	1½	Castor-cake ... ... Mds. 36	4 35 0	234 0 0	72 0 0	132 0 0	204 0 0	409 8 0	+205 8 0
44*b*	1½	Cowdung ... ... 600 Castor-cake 18	5 10 0	252 0 0	60 0 0	144 8 0	204 8 0	472 8 0	+268 0 0
45*a*	2½	Cowdung ... ... 600 Bonemeal 6	9 0 0	216 0 0	34 8 0	152 10 0	187 2 0	378 0 0	+190 14 0
45*b*	2½	Cowdung 1,200	8 0 0	192 0 0	48 0 0	151 14 0	199 14 0	336 0 0	+136 2 0
46*a*	1	Bonemeal 12	3 10 0	195 0 0	21 0 0	151 14 0	172 14 0	341 4 0	+168 6 0
46*b*	1	Unmanured	1 10 0	75 0 0	.....	151 14 0	151 14 0	131 4 0	—20 10 0
55	6½	Castor-cake 36	16 10 0	150 0 0	72 0 0	117 6 0	189 6 0	262 8 0	+73 2 0
56*a*	2½	Bonemeal 12	5 28 0	136 32 0	21 0 0	120 0 0	141 0 0	236 12 3	+95 12 3
56*b*	6½	Cowdung 1,200	14 35 12	142 39 0	48 0 0	132 0 0	180 0 0	249 6 0	+69 6 0

Statement (*k*).

Variety experiment with potatoes.

Field number.	Area in cottahs.	Variety.	Quantity of manure applied per acre.	Actual outturn.	Outturn per acre.	Cost of cultivation per acre.			Money value of outturn per acre.	Gain or loss per acre.
						Price of manure.	Other expenditure.	Total.		
				Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
43*a*	13	Naini Tal potatoes	Cowdung ... ... Mds. 360 Ashes ... 75 Bonemeal ... 12 Castor-cake ... 6	51 0 0	204 0 0	57 0 0	135 3 0	192 3 0	441 0 0	+248 13 0
43*b*	10	Cherapunji ,,	Ditto	15 0 0	90 0 0	57 0 0	131 1 0	188 1 0	135 0 0	—53 1 0
52	12	Naini Tal potatoes	Ditto	30 0 0	150 0 0	57 0 0	133 0 0	190 0 0	262 8 0	+72 8 0

STATEMENT (*l*).

Account sheet showing the receipts and expenditure of the Burdwan Farm for 1892-93.

RECEIPTS.	Amount.	Total.	EXPENDITURE.	Amount.	Total.
	Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.
Paddy	323 4 0		Wages of coolies and cost of establishment, exclusive of salary of overseer and peon.	741 14 9	
Gur	239 1 9		Food of cattle	80 12 0	
Potatoes	202 10 9		Purchase and repair of implements	20 4 6	
Jute	27 11 6		Manures	133 11 6	
Brinjals	16 13 9		Seeds	108 12 0	
Kachu	5 10 9		Rent of land	1 4 9	
Sankalu	5 12 6		Cutting of jungle and breaking up new land ...	55 6 0	
Tobacco	0 4 0		Miscellaneous charges, inclusive of cartage, &c.	50 4 6	
Total ...	.....	821 5 0	Total ...	.....	1,193 6 0
Valuation of stock in hand.			Salary of overseer	600 0 0	
			Ditto peon	66 0 0	
Straw	160 0 0		Stationery and stamps	4 15 9	
Sugarcane cutting	50 0 0		Total ...	.....	670 15 9
Tobacco	20 0 0				
Paddy	43 2 0		GRAND TOTAL ...	.....	1,864 5 9
Kachu	3 0 0				
Potatoes	2 8 0				
Gur	1 12 0				
Maize	5 0 0				
Gram	1 4 0				
Arhar	3 8 0				
Oats	7 8 0				
Chaff	5 0 0				
Onions	20 0 0				
Hire of sugarcane mill ...	8 8 0				
Grass	15 0 0				
Total ...	.....	346 2 0			
GRAND TOTAL ...	.....	1,167 7 0			

APPENDIX C.

STATEMENTS TO THE DUMRAON FARMS.

STATEMENT (*a*).

Showing results of treating sugarcane with different manures in the Dumraon Farm, 1892-93.

Number of plot.	Kind of sugarcane planted.	Method of planting.	Manures used.	Quantity used per acre.	Outturn of gur per acre.	Value of the produce.	Cost of cultivation per acre.	PROFIT OR LOSS.		Increase of yield over unmanured plot (average of 46*a* and 46*a*).	INCREASE IN NET PROFIT OR LOSS OVER AVERAGE OF 46*a* AND 49*a*.	
								Profit.	Loss.		Profit.	Loss.
1	2	3	4	5	6	7	8	9	10	11	12	13
				Mds. s.	Mds. s. ch.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.
46*a*	Manigo ...	Mauritius system.	No manure ...	...	27 33 0	79 8 0	85 10 4	...	6 2 4	...	...	...
46*b*	Do. ...	Ditto ...	Ashes	240 0	39 37 0	114 1 1	92 10 3	21 6 10	...	12 16	26 6 11	...
47*a*	Do. ...	Ditto ...	Ashes and Saltpetre ...	240 0 / 3 0	51 17 0	146 14 10	105 10 11	41 3 11	...	23 36	48 4 0	...
47*b*	Do. ...	Ditto ...	Bone ashes ... / Saltpetre ...	3 25 / 3 0	49 33 0	142 9 1	104 2 9	38 6 4	...	22 15	45 6 5	...
48*a*	Do. ...	Ditto ...	Linseed cake ...	6 0	27 9 0	77 12 7	98 11 0	...	20 14 5	—0 12	...	13 14 5
48*b*	Do. ...	Ditto ...	Saltpetre ...	3 0	61 28 0	176 4 7	98 11 0	79 9 7	...	34 7	84 9 7½	...
49*a*	Do. ...	Ditto ...	No manure ...	...	27 9 0	77 12 7	85 10 4	...	7 13 9	...	...	...
49*b*	Do. ...	Ditto ...	Bone ashes ...	3 25	49 36 0	142 9 1	91 2 1	51 7 1	...	22 15	58 7 2	...

STATEMENT (*b*).

Showing results of different systems of planting sugarcane in the Dumraon Farm, 1892-93.

Number of plots.	Kind of sugarcane planted.	Method of planting.	Manure used per acre.	Quantity of manures used per acre.	Outturn of gur per acre.	Value of the produce per acre.	Total expenditure per acre.	PROFIT OR LOSS.	
								Profit.	Loss.
1	2	3	4	5	6	7	8	9	10
				Mds. s.	Mds. s.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
40	Manigo ...	Local ...	Ashes ... / Saltpetre ...	240 0 / 3 0	36 12	103 11 5	97 1 9	6 9 8	...
41	Do. ...	Mauritius ...	Ditto ...	...	37 32	108 0 6	103 10 6	4 6 0	...
42	Do. ...	Bengal ...	Ditto ...	...	36 12	103 11 5	100 5 3	3 6 2	...

Statement (*c*).

Showing results of experiments in the use of soil-inverting versus *country plough in the Dumraon Farm*, 1892-93.

Number of Plot.	Kind of wheat sown.	How ploughed.	Outturn per acre.		Value of the produce.	Total cost of cultivation.	Profit and loss.	
			Grain.	Straw.			Profit.	Loss.
1	2	3	4	5	6	7	8	9
			Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
1	Red wheat	Soil-inverted	8 30 0	13 2½ 0	28 10 0	20 12 9	7 14 0	...
2	Ditto	Country plough	6 20 0	12 4 0	22 4 9	20 12 9	1 8 0	...
	Increase from soil-inversion ...		2 10 0	1 20 0	6 6 0	...	6 6 0	...

Statement (*d*).

Showing results of the application of different Manures on Wheat in the Dumraon Farm, 1892-93.

Number of plot.	Kind of wheat.	Manures used.	Quantity used per acre.	Outturn per acre.		Value of produce per acre.	Total cost of cultivation per acre.	Profit and loss per acre.	
				Grain.	Straw.			Profit.	Loss.
1	2	3	4	5	6	7	8	9	10
			Mds. s. c.	Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
13	White Mozaffernagar	Saltpetre and Linseed cake	3 0 0 3 0 0	10 23 0	13 24 0	33 3 9	39 11 3	...	6 7 6
14	Ditto ...	Ashes	180 0 0	12 4 0	18 6 0	39 5 2	25 11 4	13 9 10	...
15	Ditto ...	Saltpetre	3 0 0	9 33 0	12 34 0	30 15 9	32 15 10	...	2 0 1
16	Ditto ...	Linseed cake ...	3 0 0	9 3 0	12 10 0	28 13 0	27 9 7	0 3 5	...
17	Ditto ...	No manure ...	...	6 32 0	9 3 0	21 8 7	20 12 0	0 12 7	...

Statement (*e*).

Showing the effects of saltpetre on wheat, with or without irrigation, in the Dumraon Farm, 1892-93.

Number of plot.	Kind of wheat.	Treatment.	Manure used.	Quantity used per acre.	Outturn per acre.		Value of produce per acre.	Total cost of cultivation per acre.	Profit and loss per acre.	
					Grain.	Straw.			Profit.	Loss.
1	2	3	4	5	6	7	8	9	10	11
				Mds.	Mds. s. c.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
12A	White Muzaffanagar	Irrigated ...	Saltpetre ...	3	12 28 0	21 7 0	42 5 4	32 14 4	9 7 0	...
12B		Not irrigated ...	Ditto ...	3	6 26 0	12 4 0	22 10 9	30 6 0	...	7 11 3

Statement (*f*).

Showing results of the application of different manures to potatoes in the Bhojpur Farm, 1892-93.

Number of plot.	Manures used.	Quantity used per acre.	Outturn per acre.	Value of outturn per acre.	Total cost of cultivation per acre.	Profit per acre.	Loss per acre.	Increase in outturn on account of special treatment.	Increase in profit and loss on account of special treatment.	
									Profit.	Loss.
1	2	3	4	5	6	7	8	9	10	11
		Mds.	Mds. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Mds. s. c.	Rs. a. p.	Rs. a. p.
1	Hemp and bonemeal	6	142 7 0	113 11 10	104 12 10	8 15 0	...	71 4 0	33 4 10	...
2	Bonemeal	6	122 20 0	98 0 2	90 11 0	7 5 2	...	51 17 0	31 11 0	...
3	Hemp	...	108 36 0	87 1 11	95 5 7	...	8 3 8	37 33 0	16 2 2	...
4	No manure	...	71 3 0	56 13 11	81 3 9	...	24 5 10	...	...	...
5	Sawan and hemp ...	...	105 35 0	84 11 2	95 3 7	...	10 8 5	34 32 0	13 13 5	...

Statement (*g*).

Memorandum of Receipts of the Dumraon and Bhojpur Farms for 1892-93.

Grains.	Quantity of grains.	Quantity of straw.	Value of grain.	Value of straw.	Total.
1	2	3	4	5	6
	Mds. S. C.	Mds. S. C.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Wheat	53 21 0	72 29 0	133 8 0	36 5 9	169 13 9
Harfor	37 0 0	48 15 0	49 5 3	24 3 0	73 8 3
Maize	12 0 0	16 30 0	25 4 2	4 3 0	29 7 2
Paddy	8 10 0	26 0 0	15 0 0	6 8 0	21 8 0
Sugarcane cuttings	...	...	32 0 0	...	32 0 0
Potatoes	45 20 0	...	36 6 3	...	36 6 3
Gur	27 0 0	...	70 14 0	...	70 14 0
Credited to the cultivation of the experimental farms on account of works taken from them by the model farm	...	...	...	...	53 6 0
Total ...	...	...	...	...	486 15 5

Memorandum of expenditure of the Dumraon and Bhojpur Farms for 1892-93.

Particulars.				Amount.			Remarks.
1				2			3
				Rs.	A.	P.	
Establishment				758	0	0	
Travelling expenses of the Overseer				172	10	2	
Cost of cultivation—							
	Rs.	A.	P.				
Labour	183	1	6				
Feeding of bullocks	82	2	2				
Purchase of tools	5	1	9				
Seeds and manures	73	6	7				
Land rent and canal dues ...	139	12	0				
Total ...	483	8	0	483	8	0	
Constructions and repairs of roads and buildings ...				264	8	3	
Stamps and stationery				14	5	3	
Miscellaneous charges				57	8	3	
Economic Museum				105	14	0	
Total ...				1,856	5	11	

Statement (*h*).

Showing treatment and outturn of crops in the Dumraon Model Farm during 1892-93.

Number of field.	Area.	Crop.	Manure used.		Outturn of grain and seed.	Outturn of straw.	Value of outturn.
			Kind.	Quantity.			
1	2	3	4	5	6	7	8
	A. R. P.			Mds.	Mds. S. Ch.	Mds. S. Ch.	Rs. A. P.
1	2 1 0	Barley	Cowdung	225	37 14 0	38 0 0	89 0 6
2	2 1 0	Ditto	Ditto	225	36 10 0	39 0 0	87 7 6
3	2 1 0	Beardless wheat	Ditto	225	23 35 0	36 0 0	79 2 10
4	2 1 0	Ditto	Crude saltpetre	6¾	25 0 0	42 0 0	83 8 0
6	2 1 0	*Khesari*	Nil	...	60 30 0	80 0 0	137 3 2
7	2 1 0	Red wheat ...	Bone ashes ... ... / Crude saltpetre	12 / 6¾	20 0 0	45 0 0	70 0 0
8	2 1 0	Ditto	Nil	...	22 0 0	35 0 0	72 8 0
9	2 1 0	Ditto	Nil	...	13 10 0	20 0 0	43 2 0
10	2 1 0	Ditto	Nil	...	12 7 0	18 0 0	39 7 0
11	2 1 30	Red wheat and gram ...	Nil	...	20 0 0	30 20 0	45 4 0
12	1 1 13	Ditto	Nil	...	12 34 0	20 0 0	35 11 2
13	0 1 20	Linseed	Nil	...	2 34 0	...	10 5 9

STATEMENT (*i*).

Receipts and Expenditure of the Dumraon Model Farm during 1892-93.

RECEIPTS.	Rs.	A.	P.
Sale proceeds of—			
Barely ...	138	0	0
White wheat ...	123	10	10
Khesari ...	97	3	2
Red wheat ...	166	1	0
Wheat and gram ...	65	11	2
Linseed ...	10	5	9
Total ...	600	15	11
Value of straw ...	201	12	0
Stock of straw and manure in hand (of 1892-93) ...	80	13	0
Grand Total ...	883	8	11

EXPENDITURE.	Rs.	A.	P.
Cost of cultivation—			
Tillage ...	76	0	3
Seeds and manures	220	10	9
Irrigation ...	45	6	0
Harvesting and threshing ...	29	12	0
Cattle-feeding ...	190	6	9
Miscellaneous ...	6	0	0
	568	3	9
Value of work taken from the Experimental Farm ...	51	8	0
Land-rent	212	0	5
Purchase of implements ...	35	2	6
	866	14	8
Deduct cost of cultivation of 4½ acres of sugarcane ...	219	1	4
Net cost of cultivation ...	647	13	4
Add (*a*) Interest on capital outlay in permanent works at 6 per cent. on Rs. 1,619-1-7 ...	97	2	0
(*b*) Depreciation of stock at 10 per cent. on Rs. 238-0-9 ...	23	12	10
Total cost ...	768	12	2
Net profit ...	114	12	9
Grand total ...	883	8	11

APPENDIX D.*

STATEMENTS RELATING TO THE SIBPUR FARM.

STATEMENT (*a*).

Manure experiments with Jute.

Field, row, plot.	Manures used per acre.	Cost of manures.	Total cost of cultivation.	Yield of jute per acre.	Value of yield.	Profit.	Loss.
1	2	3	4	5	6	7	8
		Rs. A. P.	Rs. A. P.	Mds. S. C.	Rs. A. P.	Rs. A. P.	Rs. A. P.
F. 2, R. 4, P. 2	{Bonemeal ... 3 maunds / Castor-cake ... 3 ,,} ...	12 15 0	53 13 6	7 20 0	31 14 0	...	21 15 0
,, ,, P. 3	Castor-cake ... 6 ,, ...	12 0 0	54 6 6	11 7 12	47 10 0	...	6 12 0
,, ,, P. 4	No manure	...	42 6 0	6 24 0	28 6 6	...	13 15 6
,, ,, P. 5	Bonemeal ... 6 ,, ...	13 14 0	63 12 0	10 29 0	45 9 0	...	18 3 0

STATEMENT (*b*).

Green manuring experiments with Wheat.

FIELD, ROW, PLOT.	Manures used.	Total cost of cultivation.	Yield of wheat per acre.	Yield of straw per acre.	Value of yield.	Profit.	Loss.	REMARKS.
1	2	3	4	5	6	7	8	9
F. R. P.		Rs. A. P.	Mds. S. C.	Mds. S. C.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
2 6 2	Hemp	50 2 0	16 10 1	22 14 9	52 2 0	2 0 0	...	
3	Nil	47 14 0	10 2 0	14 12 1	33 6 0	...	14 8 0	
4	Hemp	50 0 0	15 12 0	56 0 1*	56 1 0	6 1 0	...	
5	Nil	43 4 0	6 26 1	12 36 0	22 8 0	...	20 12 0	

* Of this 33 maunds were green fodder, being the tops of the crop cut off in order to keep down the growth of the crop.

STATEMENT (*c*).

Drilling versus *sowing behind the plough for Wheat*

FIELD, ROW, PLOT.	Method of sowing.	Total cost of cultivation.	Yield of wheat per acre.	Yield of straw per acre.	Value of yield.	Profit.	Loss.	REMARKS.
F. R. P.								
6 2 2	Drilled	24 9 0	12 32 0	19 24 8	41 11 6	17 2 6	...	
3	Dibbled with hand ...	24 15 0	12 10 2	18 24 0	39 15 0	15 0 0	...	
4	Sown behind the plough	26 1 0	10 21 8	16 0 8	34 5 0	8 4 0	...	

STATEMENT (*d*).

Manure experiments with Oats.

FIELD, ROW, PLOT.	Manures used per acre.	Cost of manure.	Total cost of cultivation.	Yield of grain per acre.	Yield of straw per acre.	Value of yield.	Profit.	Loss.	REMARKS.
1	2	3	4	5	6	7	8	9	10
F. R. P.		Rs. A. P.	Rs. A. P.	Mds. S. C.	Mds. S. C.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
3 2 1A	Saltpetre 1½ Mds.	7 8 0	34 14 0	34 20 0	55 2 0	95 13 0	60 15 0	...	* The crop on this plot was badly laid by continuous rainy weather.
1B	Castor-cake 6 ,,	10 8 0	37 14 0	33 27 0	52 34 0	93 9 0	55 11 0	...	
2	Bonemeal 6 ,,	13 8 0	41 4 0	30 34 0	40 30 0	83 0 0	41 12 0	...	
3 1*	Cowdung 150 ,,	4 11 0	36 9 0	30 31 8	53 10 0	87 3 0	50 10 0	...	
2	No manure	...	27 6 0	25 0 0	34 39 14	67 14 0	40 8 0	...	

STATEMENT (*e*).

Manure experiments with Potatoes.

FIELD, ROW, PLOT.	Manures used per acre.	Cost of manures.	Total cost of cultivation per acre.	Yield of potatoes per acre.	Value of yield.	Profit.	Loss.	REMARKS.
1	2	3	4	5	6	7	8	9
F. R. P.		Rs. A. P.	Rs. A. P.	Mds. S. Ch.	Rs. A. P.	R. A. P.	Rs. A. P.	
4 2 1A.	Castor-cake, 24 mds.	39 0 0	218 1 0	103 20 0	168 3 0	...	49 14 0	The crops were seriously injured by heavy rain immediately after sowing.
1B.	Bonemeal, 12 ,, ...	27 6 0	206 7 0	94 20 0	154 2 0	...	52 5 0	
3 1A.	Castor-cake, 24 ,, ...	42 0 0	230 1 0	73 35 0	120 0 0	...	110 1 0	
	Ferrous sulphate, 30 seers ...							
1B.	Bonemeal, 12 mds.	44 4 0	232 5 0	92 31 0	150 9 0	...	81 12 0	
	Saltpetre, 3 ,, ...							
4 1A.	Castorcake, 24 ,, ...	55 14 0	243 15 0	103 11 0	167 1 0	...	76 14 0	
	Saltpetre, 3 ,, ...							
1B.	Cowdung, 300 ,, ...	9 6 0	180 15 0	108 18 0	176 4 0	...	4 11 0	
5 1	No manure	...	116 4 0	75 15 0	122 5 6	6 1 0	...	

STATEMENT (*f*).

Green manuring experiments with Potatoes.

F. R. P.								
5 1 2 3(1)	Green hemp about, 700 mds. ..	40 10 6	205 10 6	91 20 0	148 11 0	...	56 15 6	The crops were seriously injured by heavy rain immediately after sowing.
(2)	Ditto ditto, ditto and castor-cake, 18 mds ...	66 3 6	231 3 6	114 3 9	185 7 9	...	45 11 9	
(3)	Castor-cake, 18 ,, ...	25 9 0	190 9 0	76 6 5	122 4 0	...	68 5 0	

STATEMENT (*g*).

Variety experiments with Sugarcane Ratoon Crop.

FIELD, ROW, PLOT.	Area.	Varieties of sugarcane.	Yield of first crop 1891-92, per acre.	Yield of ratoon crop, 1892-93, per acre.	REMARKS.
1	2	3	4	5	6
F. R. P.	Cottah.		Mds. S. Ch.	Mds. S. Ch.	
6 5 5(1)	2½	Red Shaharampur	74 1 0	68 22 0	Three more varieties *bagdia*, *kajla*, and *dhalsunder*, were included in this variety experiment, but they occupied comparatively small areas, and were somewhat mixed up with *samshara* canes. Hence they are omitted from this statement.
(2)	2½	Samshara	71 14 8	29 28 0	
(3)	2½	White Bombay	61 26 0	22 8 0	
(4)	2½	Puri	56 29 8	36 6 0	
6 (5)	2½	Khari...	50 26 8	70 32 0	

STATEMENT (*h*).

Experiments in Tobacco.

FIELD, ROW, PLOT.	Area of sub-plot in fraction of a bigha.	Variety of tobacco.	Special manure used per acre.	OUTTURN OF DRY LEAF. First cutting.	Second cutting, if any.	Total.	Total cost of cultivation per acre.	REMARKS.
1	2	3	4	5	6	7	8	9
F. R. P.				MDS. S. C.	MDS. S. C.	MDS. S. C.	RS. A. P.	
6 2 5 (1)	½	Rangpur ...	Sulphate of potash 3 mds.	19 14 0	...	19 14 0	85 14 0	Separate accounts of expenditure were not kept.
(2)	½	,, ...	Saltpetre 3 ,,	15 16 8	...	15 16 8	85 14 0	
(3)	☆	Matihar ...	Sulphate of potash 3 ,,	7 35 0	3 24 0	11 19 0	85 14 0	The Rangpur variety was
(4)	☆	,, ...	Saltpetre 3 ,,	7 26 0	3 33 0	11 19 0	85 14 0	found to be very late
6 2 6 (5)	½	Hingli ...	Sulphate of potash 3 ,,	9 0 0	6 0 0	15 0 0	108 6 0	in maturing, and did not
(6)	½	,, ...	Saltpetre 3 ,,	6 18 0	4 14 0	10 32 0	108 6 0	give a second crop. The
(7)	½	Havana ...	Sulphate of potash 3 ,,	12 6 0	4 8 0	16 14 0	108 6 0	earliest to ripen was
(8)	½	,, ...	Saltpetre 3 ,,	8 28 0	3 36 0	12 24 0	108 6 0	the *hingli*.

STATEMENT (*i*).

Receipts and expenditure of the Sibpur Farm during 1892-93.

RECEIPT.	Rs.	A.	P.
From produce of cultivation ...	1,049	7	9
Miscellaneous sources ...	175	13	9
Total ...	1,225	5	6
Actual cost to Government ...	1,753	11	1
GRAND TOTAL ...	2,979	0	7

EXPENDITURE.	Rs.	A.	P.
Cost of cultivation—			
Labour	962	5	6
Feed of cattle ...	157	0	6
Implements ...	26	0	0
Seeds	240	11	7
Manures	136	6	6
Total ..	1,522	8	1
Salary of overseer ...	600	0	0
Repairs to roads ...	56	2	0
,, ,, sheds ...	109	13	6
,, ,, canals ...	9	0	0
Municipal taxes ...	465	0	0
Miscellaneous expenses ...	216	9	0
Total ...	1,456	8	6
GRAND TOTAL ...	2,979	0	7

APPENDIX E.

MR. B. PALCHOUDHURI'S REPORT ON THE NATUDA FARM.

Dated Calcutta, the 28th May 1893.

Demi-official from—B. PAL CHOUDHURI, Esq.,
To—The Officiating Director of Land Records and Agriculture, Bengal.

I HAVE been asked by Mr. Basu to send you an account of my home farm at Natuda for the year 1892-93, and have accordingly much pleasure in handing you the following report, in which I have briefly described the objects with which the farm was established, and the results of last year's operations.

2. The chief and ultimate object I have in view in establishing the farm is to set an example of improved husbandry to my tenants. Every attempt will be made to work up the farm steadily to that end. There are many directions in which the agriculture of the district seems to be capable of improvement. Last year I tried to demonstrate a few easy and apparent improvements in my farm with, on the whole, encouraging results. I am loath, however, to commit myself to over sanguine expectations which may not be fulfilled in the long run, and as the only test and measure of the success of my farm will be its influence on the agriculture of the surrounding country, it will probably be many years before the actual results of the undertaking can be told with certainty.

3. I believe a great deal of useful information has been acquired in the numerous experimental farms established by Government in different parts of India. I have myself seen much to interest me in the Sibpur Farm, which I have frequently visited in company with Mr. Basu. But I believe at the same time that the millions are incapable of profiting by the lessons taught by the experimental farms. They are too poor and ignorant to adopt any of the improvements until they see these thoroughly naturalised, as it were, to their surroundings. I do sincerely hope my home farm will prove to be the means of spreading much useful knowledge of improvements among my tenantry.

4. Mr. Basu has pointed out to me another advantage which, it is hoped, will flow from the working of the Natuda Farm. If I can make it pay, as I have every hope it will, it may induce many of my educated young country men, so sorely in need of employment, to take to agriculture as a profession, and there can, it seems, be no better and easier way of influencing the course of Indian agriculture than by leavening its ranks with men of education and intelligence.

5. The farm has an area of 292 standard bighas, or a little less than 100 acres. Out of these about 30 acres are low paddy lands and the rest dry up-land. The low land area is situated like a trough in the very centre of the farm, and receives the surface drainage of the surrounding lands. The soil is a fertile clay. The up-land area has, however, soils varying from sandy to light loam, and is almost everywhere of poor quality. They appear to be thoroughly worn out by long cultivation. I am not sorry for the soil being poor, and should rather be glad for it, as any example taught by the farm must be the more convincing.

6. The farm has just completed the first year of its existence. The first thing I had in view was to utilise the accumulations of cattle-dung in the neighbouring villages, which are at present wasted in spite of the land being sorely in need of manure. The backwardness of the agriculture of the district would appear from this one fact alone. I tried to open the eyes of the people to this neglected source of wealth, and I believe that my example has already had some good effect.

7. I tried during the year to introduce several other improvements into the cultivation of the farm in consultation with Mr. Basu.

These were—

(1). The introduction of new staples and new and improved varieties of existing crops. The following were grown during the year—

(*a*) *Maize.*—Seed was procured chiefly through Mr. Basu from Chota Nagpur and Kalimpong Hills. The crop was sown on about 17 acres of land, the outturn was a little less than 12 maunds per acre. The crop grew fairly well and a better outturn was expected, but a portion of the crop was destroyed by jackals, and it is believed that a small portion was also lost by theft. There is as yet no local market for maize, but I hope to be able to create a taste for this excellent article of food among the people of the neighbourhood.

(*b*) *Buxar wheat.*—Mr. Basu supplied the seed. The crop grew well, but the abnormally heavy rain in February and March reduced the outturn and also injured the quality of the grain. I have sent to Mr. Basu a sample of the produce for valuation. The grains, though poor in quality, compare favourably with those of the local hard red variety known as *jamali.* The outturn of the Buxar variety was also quite equal to that of the jamali. The total produce of wheat from 12 acres of land was exactly 100 maunds.

(*c*) *Oats.*—Like maize, oats are a new crop, not generally known. The crop was injured by heavy rain. The gross outturn from 17 bighas ($5\frac{2}{3}$ acres) amounted to 50 maunds.

(*d*) *Up-country barley.*—The seed of this was obtained from Dumraon through Mr. Basu. Of all the new crops and varieties tried, this gave the best result. The outturn was 31 maunds 10 seers from 7 bighas, or about $13\frac{1}{2}$ maunds per acre. Apart from the outturn, which would have been better but for the unfavourable weather of the year, the quality of the produce was exceedingly satisfactory. The grains were more than twice the size of the grains of the local variety. The entire produce has been preserved for sowing next season, and for sale as seed to my tenants.

(*e*) *Potatoes.*—These too are a new crop. Mr. Basu sent the seed of two varieties (Nainital and Khasia Hills) from Calcutta. The area planted was $1\frac{1}{2}$ bighas and the outturn was $27\frac{1}{2}$ maunds, or at the rate of 55 maunds to the acre. The outturn cannot be considered satisfactory, but the quality was good. Poor soil and want of sufficient irrigation account for the poor outturn. Every attempt is being made to improve the quality of the soil by heavy manuring, and to remove the want of water for irrigation. I will presently mention what I have done towards the latter end. I intend to grow potatoes on a large scale on the farm.

(*f*) *Fodder grasses.*—Sugar-sorghum and reana were the two grasses tried. Both grew very well and with little labour. Both kinds of fodder were eaten with the greatest relish by my cattle. Only one cutting was taken.

The average outturn from nearly 4 acres of land was 30 cart-loads (nearly 300 maunds) per acre. I have saved a large quantity of seeds of both the grasses, and will sow a larger area with them in the current year.

(*g*) *Gram.*—Seed of the large grained variety was obtained from Dumraon, but failed to come up well. The seed was very likely bad.

Besides the crops named above, the ordinary crops of the district were grown on a large area.

(2). *The use of improved implements.*—The following were used:—

(*a*) *Soil-inverting ploughs.*—I used several ploughs of this description, made by Messrs. Ransomes, Sims and Jefferies of Ipswich, in my indigo cultivation, and found them to be useful. On the home farm 40 bighas of land were ploughed up with these ploughs towards the end of the year.

(*b*) *American Planet Jr. hand-hoes.*—Mr. Basu lent me two of these for trial on the farm. I found them to be exceedingly useful in cleaning the interspaces between rows of the chilli crop, which I grew on about seven acres of land last year. I am sure I could not keep the cultivation of this crop under proper control without the aid of these implements, which caused, besides, a great saving in the cost of hoeing and weeding, amounting to about Rs. 15 an acre. I put two men with two hoes to work on the seven acres of land, which they could manage to go over once every fortnight. Many of my raiyats were so pleased with the working of the hoe, that they expressed a desire to take them on hire. Since then I have procured through Mr. Basu four hoes from America for use on my farm, and they have been already put to work among the maize crop. Mr. Basu has also kept two more hoes belonging to your department for hire to raiyats. It remains to be seen during the ensuing season whether they will take to the use of these hoes.

(*c*) *Maize-huller.*—This machine was lent to me by Mr. Basu, and was found to be wonderfully effective. With it I had 190 maunds of corn separated at a cost of Rs. 5-15, *i.e.*, exactly six pies per maund; in fact after the machine had been shown at work, the separation was done by contract labour at the fixed rate of two pice per maund. The maximum quantity of grain separated in one day of eight hours was 32 maunds 23 seers. I intend to shortly purchase a machine for the farm. I should, however, remark that the machine seems to be of too light construction to be safely entrusted to unskilled labour. A more solidly-built machine would work better.

(3). *Permanent improvements of the Farm.*—I have three specific improvements at present in view. None of them has yet been carried out; but I hope to be able to complete them duing the course of this year. In the first place the chief want of the farm is the supply of water for irrigation. Last year I had two wells sunk in the farm, but the supply was hardly enough to afford water for a couple of bighas of land. Failing wells, I have thought of connecting the bheel in the centre of the farm with the river by a narrow canal which will lead flood water from the river for storage in the bheel. In this way I hope to secure an adequate supply of water for irrigating cold-weather crops, chiefly potatoes. I intend to set up a small steam-engine for pumping up water for irrigation. Nearly one-half of the canal has been already completed. The next work of improvement is the enclosing of the farm with a live-fence. The work is necessary to prevent cattle trespass, which is one of the greatest curses of our agriculture, and to minimise theft of crops. The third item of permanent improvement I have in view is the construction of a properly equipped farmstead, especially of cattle-sheds, on somewhat the same plan I have seen on the Sibpur Farm. The proper conservation of cattle manure is a subject little understood in Bengal. The urine of the animals, which I understand is as valuable as the dung, is absolutely wasted. Much of the effective matters of the dung is allowed to sink into the ground or to be washed away. I believe the plan of conservation I have seen at Sibpur will prevent all this loss.

8. The financial results of the farm for the year under review were not, I regret to say, satisfactory. The chief dependence of the farm was on the *rabi* crops, which were much injured by heavy and continuous rain in February and March. The receipts amounted to about Rs. 2,550, which was short of the total expenditure by about Rs. 300. I do not, however, attach much importance to the pecuniary results of the first year, which was necessarily a year of experiment and enquiry for me. In fact, I do not hope to reduce the working of the farm to a regular and well-ordered system before another couple of years or so. After the permanent works of improvements have been completed and my men trained to the work, it will be time to judge of the financiaal condition of the farm.

9. I cannot conclude this brief report without offering my best thanks to you and Mr. Basu for your kind support.

APPENDIX F.

No. 83 $\frac{V.D.}{93}$, dated Calcutta, the 10th June 1893.

From—Veterinary Captain W. D. Gunn, Superintendent of the Civil Veterinary Department, Bengal,

To—The Director of the Department of Land Records and Agriculture, Bengal.

In accordance with Government of India's Circular No. $\frac{43}{120}$, of the 15th November 1892, I have the honour to submit a brief report on the work done by the Civil Veterinary Department since my appointment as Superintendent on 31st May 1892.

During the first-half of the official year, the greater part of the time was utilised in thoroughly examining all the large stables in Calcutta, particular regard having been paid to the construction of the various floorings and roofs, so that we might have the best possible system for the Bengal Veterinary Institution. I have every reason to believe that the floorings and roofs copied from the system in use in the Tramway Company's new stables in Wellesley Street will prove eminently satisfactory. In conjunction with Mr. Gwyther, plans for the Bengal Veterinary Institution were drawn up and met with the approval of the Board of Management, and also of the Inspector-General of the Civil Veterinary Department.

The buildings of the school and hospital of the institution are now making rapid progress, and it is expected that the buildings will be ready for occupation in August or September. The school will have ample accommodation for 50 students who will undergo a thoroughly practical course of instruction in equine and bovine pathology, and it is hoped that they will eventually render useful service to the country.

Mule breedings.—There is probably only one part of Bengal in which mule-breeding could be carried on, viz., Darjeeling district. Caste prejudice is mainly accountable for this, as there seems to be a serious disinclination to mate pony mares with a donkey stallion among the natives of Bengal. No doubt in course of time the owners of ponies will see their advantage in mule-breeding, which animal will undoubtedly be largely used in future wars and for transport requirements.

Two good donkeys have been indented for for use in Kalimpong and Sikkim, and I feel sure that the people will readily take advantage of their services when available.

Horse and Cattle Fairs.—There is only one fair of any importance held in Bengal, viz., Sonepur, where a very large number of various animals are collected for sale. Efforts are now being made in Kalimpong and Kurseong for the annual collection of animals and produce, and if continued are likely to lead to good results.

At the Kalimpong mêla I have every reason to believe the Commissariat and Transport Department propose sending an officer for the purpose of purchasing mules. The Reverend J. A. Graham, the Honorary Secretary, has interested himself in the matter, and has sent circulars widely about the country and into Thibet, telling the people that Government will have a representative to purchase mules of a good quality, and will be willing to give a fair price for an animal answering to their requirements. This should be the means of opening up a good market and free communication with Thibet.

Both at Kurseong and Kalimpong, cattle were very poorly represented at the last fairs, in consequence of the fear of spreading cattle disease, which at that time was very prevalent in the Darjeeling Hills. Next year, it is hoped, will show an improvement on the last.

The Sonepore fair consisted chiefly of an enormous collection of cattle, horses, and elephants, and although constant supervision was exercised, no case of contagious disease was detected. Certain improvements were suggested in my report on the last mêla which, if carried out, would allow of the animals being seen better, and add very much to their comfort.

Cattle disease.—Excepting in the Darjeeling district, there has been remarkably little cattle disease in Bengal. A few sporadic cases have occurred in the districts of Noakhali, Jessore, and Singhbhum, where the disease seems to be enzootic. There has, however, been no epidemic or outbreak of any considerable degree, except in the Darjeeling Hill district, where cart traffic at one time threatened to cease during the year 1892-93. The principal diseases of a contagious nature which have affected the cattle in Bengal, are rinderpest and foot-and-mouth disease. The latter is not a very serious affection, and with ordinary care as to cleanliness few animals are lost. On the other hand, if the disease is quite neglected, ulceration of the foot frequently occurs, which renders the animal quite useless afterwards. The dissemination of veterinary surgical knowledge through the means of the Bengal Veterinary Institution will very much improve this state of affairs, provided always that we receive the required help from the District Boards and Municipalities in the matter of sending desirable students for instruction.

In the case of outbreak at Kalimpong, the surrounding district was visited by me three times, and a trained veterinary assistant was sent among the people with written instructions and drugs. Very many valuable cattle were saved in this manner, and the people were taught the value of segregation and the best means of nursing and treating their animals. The veterinary assistant complained, however, that the cattle-owners were very careless, and great difficulty was experienced in trying to overcome their ignorance and prejudices. When the agriculturalists and owners of animals see that our new methods of veterinary medicine and surgery are really beneficial, and that our sole idea is to help them to save the lives of

their animals, they will, I have no doubt, give us all the help they can, but it is only by practical good that we can hope to gain their confidence.

The Calcutta Pinjrapole has been frequently visited, as has also that at Raneegunge. Rinderpest in a very virulent form broke out, or was imported into the former place, but happily by stringent and energetic measures the epidemic was at once repressed. A recommendation was made to the Committee of the Pinjrapole that an intelligent veterinary assistant should be placed in charge of the establishment at Sodepur, so that cases of contagious diseases might be detected at once. They would then be reported to the Civil Veterinary Department, and proper measures adopted for their repression. The nature of the sick and surgical cases admitted into the institution likewise urgently called for skilful treatment. The Committee very willingly adopted the recommendations made, and now the Pinjrapole is in every sense of the word what it pretends to be a charitable institution, where sick and old animals are admitted, fed, and carefully treated.

During my visits to different districts opportunity was taken to explain to District Boards the object of the Bengal Veterinary Institution and the class of student that was required, and it was found that, after the matter had been explained to the members, that they were quite satisfied with the idea, and were willing to send students of the required standard of education to the institution, and to give employment to them afterwards.

The District Boards were much interested in the various suggestions made for the improvement of their cattle, particular stress being laid on the size and class of bulls required for certain purposes. For instance, it was pointed out that a big Mysore or Hissar bull was not at all suitable for plough cattle of Bengal, a cross with a stout Burman bull being advisable, the reason being that up-country Burman cattle receive the whole of the cow's milk, and are therefore all better nourished as calves than the Indian cattle, and this is more recognisable as the animal becomes matured, the result being that it is low, sturdy, and powerful, and just the bull for breeding plough cattle. For draught cattle a much larger bull is required. Benefit will undoubtedly be derived from the importation of new blood, even if the bulls are not quite up to the required standard, for so much in breeding must surely tend to degeneration.

APPENDIX G.

Statement of work done by MR. BHUPAL CHANDRA BASU, *Assistant to Director of Land Record and Agriculture, Bengal, during the year* 1892-93.

Month.		Nature of work.	Number of days.
April	1892	... Enquired into and reported on the cheese-making industry in Mymensingh ...	2
July	„	... Inspected the Natuda farm	3
August	„	... Inspected the Dumraon farm and Jheria experiments in Manbhum (12), Sibpur farm (3)	15
September	„	... Made agricultural enquiry in Nadia (8), and inspected the Sibpur farm (4) ...	12
October	„	... Inspected the Natuda farm (3), assisted in the Kalimpong show (12), and inspected the Sibpur farm (2)	17
November	„	... Inspected experiments in Jalpaiguri (8) and the Sibpur farm (2)	10
December	„	... Inspected the Dumraon farm (7) and the Sibpur farm (3)	10
January	1893	... Worked on and inspected the Sibpur farm (14), enquired into date-sugar industry in Jessore (2), and visited Cossipore in connection with the annual show (1)	17
February	„	... Assisted in the Cossipore show (3), in the Dumraon show (6), inspected bone-crushing work at Chapra (4), and inspected the Sibpur farm (3) ...	16
March	„	... Assisted in the Kurseong show (7), inspected experiments in Jalpaiguri (4), visited proposed *rhea* farm near Hooghly (1), and inspected the Sibpur farm (4) ...	16
		Total number of days on tour ...	118
		Assisted in the Director's office in the preparation of agricultural statistics and forecasts ...	47
		Did my own office work	81
		On privilege leave from 20th April to 19th July 1892	91
		Holidays	28
		Total ...	365

Statement of work done by MR. NAGENDRA NATH BANERJEI, *Assistant to Director of Land Records and Agriculture, Bengal, during the year* 1892-93.

Month.		Nature of work.	Number of days.
April	1892	... Inspected the Dumraon farm (9), and the working of the dairy at the Buxar Jail (2)	11
May	„	... Inspected the Sibpur farm	1
June	„	... Ditto ditto	1
July	„	... Ditto ditto (1)	18
		Inspected the Burdwan farm (7) ...	
		Ditto Dumraon farm	
		and ditto dairy at Buxar Jail (10) ...	
August	„	... Attended lectures at the Babugarh horse-breeding depôt in the North-Western Provinces, under orders of Government, and reported on the operations conducted at the depôt (11)	20
		Acquainted myself with the working of the Cawnpore experimental farm (3) ...	
		Inspected experiments of raiyats at Belcoolie (1)	
		Inspected agricultural experiments in the Dighapatia estate in Rajshahi (5) ...	
September	„	... Inspected Babu Chandra Nath Chowdhury's experimental farm at Chatkaberia in Baraset (2)	9
		and Mr. N. C. Boral's farm at Nilganj in Barrackpore (2)	
		and inspected Burdwan farm (5) ...	
October	„	... Inspected the Sibpur farm (1) ...	4
		Ditto the Burdwan farm (1) ...	
		and inspected demonstration farm at Nandogram (2)	
November	„	... Inspected Mr. N. C. Boral's farm at Nilganj and made enquiries into date sugar industry (1)	6
		Inspected the Sibpur farm (2)	
		Ditto the Burdwan farm (3) ...	
December	„	... Inspected the Burdwan farm (3) ...	4
		and the Sibpur farm (1)	
January	1893	... Inspected experiments of raiyats at Belcoolie (1), Mr. N. C. Boral's farm at Nilganj (2), and the Burdwan farN (8) ...	11
February	„	... Inspected the Burdwan farm (3) ...	14
		Assisted in the Cossipore Agri-Horti-Floricultural Exhibition (2)	
		Assisted in the Dumraon Exhibition (5) ...	
		Ditto Kushtea Exhibition (4) ...	
March	„	... Assisted in the Khulna Exhibition (4) ...	7
		Inspected the Burdwan farm (1) ...	
		Experiments of raiyats at Belcoolie (1) ..	
		and the Sibpur Farm (1) ...	
		Total number of days on tour ...	106
Assisted in the Director's office in the preparation of agricultural statistics and forecasts and the disposing of important agricultural files			82
Did my own office work and Mr. Basu's office work during his leave from 20th August to 19th July 1893			119
(Holidays inclusive of Sundays)			58
		Total ...	365

E. J. H. & E. D'S.—Reg. No. 1601J—628—25-7-93.

REVENUE DEPARTMENT.

AGRICULTURE.

CALCUTTA, THE 23RD DECEMBER 1893.

RESOLUTION—No. 5309Agri.

READ—

Letter No. 977A., dated the 14th September 1893, from the Board of Revenue, submitting the Annual Agricultural Report of the Director of the Department of Land Records and Agriculture for the year ending 31st March 1893.

THIS is the first separate report on Agriculture which Government has received, and the Lieutenant-Governor is pleased to record his satisfaction with the care and completeness with which the report has been drawn up. The first chapter contains a brief account of the harvests of the year, together with a list of the Agricultural Statistics which, under existing orders, the Director furnishes to Government. The Director's estimate of the outturn of the various harvests is on the whole favourable, and the Lieutenant-Governor fully accepts the view that, except in a few districts, the production of food-grains during the year was not less than the average. The statistics furnished comprise periodical forecasts and reports relating to the different crops and were submitted with commendable punctuality during the year, together with certain annual statements, of which the most important form the set of statistics known as the "Agricultural Statistics" for 1891-92. The latter were received long after the date on which they were due; but it is known that their compilation entails considerable labour. Similar statistics for 1892-93 are now overdue, and have not yet reached Government.

Emigration to Burma.

2. The number of emigrants from Bihar to Burma increased from 77 in 1891-92 to 313 during the year under report; nearly all of them were from the neighbourhood of Arrah. Mr. Macpherson quotes some interesting remarks on the subject by Mr. J. L. Mackay, C.I.E., from which the following extract is taken:—

"Several men of the first batches of emigrants have been back to their homes for their families and friends, thus doing recruiter's work in its most satisfactory form.

"It has been found by experience that Biharis are not suited to compete successfully with the Madrassi coolies employed in factories, &c., in Rangoon and the towns, but they do better as agriculturists. The men who returned to their friends are all of this latter class, and they speak well of the country and their prospects when questioned.

"The requirements and conditions of the journey and voyage are becoming much better known, and the emigrants now show scarcely any of the fear and hesitation that appeared at first, though there are still occasional desertions at the last moment before sailing."

Tree-planting.

3. No tree-planting operations on a large scale were carried on during the year. The Board of Revenue suggest that the cultivation of pear, apple and other fruit trees should be tried experimentally on the large plateau called the "Main Pat" in Sirguja, or other elevated tracts in the Tributary States of Chota Nagpur, but such experiments must be left to private enterprise, unless as suggested the Chiefs will take an interest in the matter.

In this connection, it may be remarked that a report written in 1883 by the late Mr. Worsley, regarding the system of planting trees along the sides of roads followed by him when he was in charge of the district of Muzaffarpur was, with some additions, circulated to all Commissioners of Divisions during the year, with an expression of the Lieutenant-Governor's opinion that Mr. Worsley's system might be adopted with advantage by all District Officers and District Boards in Bengal. Under this system young trees are raised in nurseries from seed sown in pots, and when five or six feet high they are planted out at the commencement of the rainy season along the sides of roads. A list of trees was drawn up whose planting was recommended where the soil is suitable, care being taken not to plant large and small fruit-bearing and timber trees indiscriminately together.

Pebrine.

4. In connection with the enquiry into the diseases of silkworms on which Mr. Nitya Gopal Mukherji has been employed since 1886, the Lieutenant-Governor recognizes the useful work done by that officer in promoting the distribution and use of healthy seed. The rearing stations of Kalimpong, Pokhuria and Khulna were kept up during the year, and new stations were opened at Babukhali in Jessore and Kagachira in Malda. The growing popularity among native rearers of seed selected on the system adopted by Mr. Mukherji is an encouraging proof of the progress which has been made. His Honour has also read with interest the account contained in the Director's Report of the experiments recently conducted at Alipore by Messrs. J. A. Anderson and R. A. Lyall. These gentlemen are to be congratulated on the success with which they obtained healthy seed by the simple device of subjecting the worms to healthy conditions of life, including constant and sufficient food. Their success, indeed, has been such as to suggest a doubt in regard to the existence in India of the diseases known as pebrine and muscardine, which, being due to specific causes, cannot, it is said, be eradicated by merely providing the worms with good food and fresh air. This surmise, however, which can only be regarded as tentative, is at variance with the view hitherto accepted; and in order to set all doubts at rest, Mr. Mukherji has been requested to take steps to bring the matter to a practical issue. The experiments will be undertaken as soon as the necessary appliances are available, and their result is awaited by Government with interest.

Agricultural experiments.

5. A large part of the report is taken up with an account of the agricultural experiments conducted in these Provinces during the year. The Lieutenant-Governor, while admitting the interesting nature of those experiments, concurs in the remark made by the Board that their history is not of great general value on account of the absence of sufficient information as to the soils experimented on.

Burdwan experimental farm.

6. At the Burdwan farm experiments were conducted by the Director's Assistant, Mr. Nagendra Nath Banerji, with sugarcane, fodder-grasses, jute, paddy, maize, potatoes, wheat, barley, gram and oats. They showed, among other things, that a mixture of bonemeal and saltpetre proves a profitable manure for the winter paddy crop. The best plot on the farm yielded 55½ maunds of grain, and 61 maunds 35 seers of straw per acre, a result obtained by the application of 3 maunds of bonemeal and 30 seers of saltpetre, costing Rs. 9-6 per acre. After deducting the cost of manure and of cultivation, the nett profit per acre in the plot amounted to Rs. 99-10-3.

The gross expenditure of the farm during the year was Rs. 1,864-5-9, against Rs. 1,565-14-4 of the preceding year, the increase being due to the addition of new land to the farm. The actual cost of cultivation was Rs. 1,193-6, while the income was Rs. 1,167-7 as against Rs. 1,162-3 in the previous year.

Dumraon, Bhojpur and Sibpur Farms.

7. The crops under experiment in the Dumraon Farm were winter paddy, sugarcane and wheat; in the Bhojpur Farm potatoes, and in the Sibpur Farm jute, *aus* paddy, fodder grasses, wheat, oats, barley, potatoes, sugarcane, cotton, tobacco, and cabbage. One of the results brought out by the experiments was to confirm the experience of previous years that a plough which inverts the soil gives a larger outturn of wheat and paddy than the country plough which breaks the soil, but does not invert it. It is reported that a plot on which a plough of the former description had been used gave 2 maunds 10 seers of wheat, and a nett profit of Rs. 6-6 over and above the outturn and nett profit of a plot on which the country plough had been used.

The total expenditure at Dumraon and Bhojpur on the experimental farms and Economic Museum amounted to Rs. 1,856-5-11, the actual cost of cultivation being only Rs. 483-8.

Experimental cultivation of tobacco.

8. The cultivation of tobacco was undertaken for the first time in the Sibpur Farm. Three country varieties, viz. (1) Rangpur, (2) Matihar, (3) Hingli, and the American variety known as *Havana* were planted on one-third of an acre of land, and it is reported that they gave a good outturn.

The leaves were cured in the shade, and Government will be glad to be informed of the further progress of the experiment, when the opinion of an expert has been obtained on the results achieved.

The total actual cost of cultivation in the Sibpur Farm amounted to Rs. 1,522-8-1, while the income was Rs. 1,225-5-6.

Bones as a manure.

9. The manufacture of bonemeal was continued during the year at the Jalpaiguri and Darjeeling Jails, and was also introduced into the Saran Jail. The bone-crushing operations at the Jalpaiguri Jail were transferred in July 1892 to the exclusive supervision of the Jail Department. The total outturn of bonemeal in the Jalpaiguri Jail amounted to 77 maunds 25 seers, which were sold chiefly to European tea planters, for Rs. 110-8. Two hundred maunds of bonemeal were manufactured at the Saran Jail, and sold to an European indigo planter at Re. 1-8 per maund, the cost of manufacture being a little under Re. 1. The Director gives in his 40th paragraph an interesting summary of the results of the action taken by his Department since 1890 in the utilization of bones for manure. It is to be regretted that native cultivators have not hitherto appreciated the advantages of bonemeal manure to a greater extent.

Veterinary Institution.

10. The Bengal Veterinary Institution, located at Belgachia on the Belgachia-Dum-Dum road, about five miles from Government House, is now practically ready. The Institution owes its origin mainly to the munificence of Babu Sheo Baksh Bogla of Calcutta, who contributed Rs. 30,000 and 3¼ bighas of land, and of Sir Dinshaw Manukji Petit of Bombay, who gave a further donation of Rs. 25,000. The total cost of the buildings will be Rs. 82,799 according to the estimate, and the balance required will be provided from Provincial revenues. The Institution, which has been constructed on plans approved by the Committee of Management and the Inspector-General of the Civil Veterinary Department, includes a lecture-room, museum, pharmacy, library, reading-room, four horse wards and four cattle wards, *post-mortem* room, forge and stables for isolated cases, besides offices for the Superintendent and Assistant Superintendent, and a residence for the latter. Veterinary Captain W. D. Gunn was appointed during the year to be Superintendent of the Civil Veterinary Department, Bengal, and of the Bengal Veterinary Institution, and all District Boards were informed that he would be available for consultation by them and other local authorities on any matters connected with horse and cattle-breeding, or diseases of horses and cattle. In connection with the Veterinary School to be attached to the Institution 30 stipends of Rs. 5 each to be held by pupils are to be offered, besides a scholarship of Rs. 10 a month founded by Dr. Kenneth McLeod, late of Calcutta. Mr. E. Burke, Veterinary Overseer, Civil Veterinary Department, has been appointed on Veterinary Colonel Hallen's nomination to be Assistant Superintendent. Rules for the admission of students and animals to the Institution have been drawn up and are now under the consideration of Government. Full clinical and other facilities for the instruction of veterinary students will be afforded, and while designed specially for Bengal, the Institution is open to students from all parts of India.

11. The Director has appended to his present Report Veterinary Captain Gunn's account of the work which he has done since his appointment as Superintendent of the Civil Veterinary Department, Bengal, on the 31st May 1892. The Lieutenant-Governor admits that at the commencement of a new undertaking too much must not be expected, but for the future he looks to the Superintendent to suggest and carry out a systematic scheme for the collection of information on subjects within the scope of the Veterinary Department. It is desirable that Veterinary Captain Gunn should acquire experience of the conditions of animal life in this Province, and devote as much of his time as he can spare from his duties in connection with the Bengal Veterinary Institution to thorough investigation in the districts with the object of acquiring and placing on record a stock of useful information which may eventuate hereafter in practical measures being undertaken to the great advantage of the country. Instructions have recently been received from the Government of India for the supply by Provincial Veterinary Officers to the Assistant to the Inspector-General, Civil Veterinary Department, of information regarding animal diseases and cattle breeds in India. In connection with the

latter subject, the Superintendent's Report shows that he has suggested to the District Boards which he has visited the importation of Burman bulls as a means of improving the breed of cattle in their districts. It is stated that the District Boards of Mymensingh and Tippera have indented for two Burman bulls. The attention of the Superintendent should be drawn to the results reported in paragraph 52 of the Director's Report, which were obtained by the use of the Hissar, English and Bachour bulls for the purpose of breeding; and he should compare them with the results obtained by the use of Burman bulls.

Cattle-breeding.

12. It was at one time proposed that experiments on mule-breeding should be conducted by the Political Agent of Sikkim at the cost of the State, but the proposal was abandoned on the ground that the finances of the State did not justify such expenditure. Since this decision was come to, a circular calling attention to the importance of the subject, and suggesting certain action, has been received from the Government of India; and the Lieutenant-Governor awaits a report from the Director. Veterinary Captain Gunn is mistaken in thinking that any indent has been made by this Government for donkeys for use in Kalimpong and Sikkim.

Mule-breeding.

13. The Superintendent is wrong in supposing that there is only one cattle fair of any importance in the Province, as he will doubtless discover for himself when he has been longer in the Province. With reference to his remarks on the Sonepur fair, it may be stated that there are difficulties in the way of effecting the improvements he suggests, as the land on which the fair is held is not under the control of the District Board, but belongs to private landowners. The local officers will, however, do all they can to improve the arrangements. The Lieutenant-Governor will bring to the notice of the Government of India the remarks made by Veterinary Captain Gunn in connection with the Kalimpong mêla.

Horse and Cattle fairs.

14. Cattle disease was present in other parts of the province as well as in Darjeeling, though no virulent outbreaks were reported, except from Kalimpong. Veterinary Captain Gunn visited the latter place thrice during the progress of the disease, and his action appears to have been energetic and useful; his services at such times will no doubt be more frequently applied for in the future, when the benefits of his presence and advice become better known.

Cattle disease.

15. The thanks of the Lieutenant-Governor are due to Mr. Macpherson for his efficient supervision of the Department during the year under report. The remarks of the Director regarding his three Assistants, Mr. Nitya Gopal Mukerji, Mr. Bhupal Chandra Basu, and Mr. Nagendra Nath Banerji, all of whom, especially Mr. Basu, rendered good service, will be communicated to the Appointment Department.

Officers.

ORDER.—Ordered that this Resolution be published in the *Calcutta Gazette*. Ordered also that a copy of the Resolution be submitted to the Government of India, in the Revenue and Agricultural Department, for information, and that a copy be forwarded to the Board of Revenue for information and guidance.

By order of the Lieutenant-Governor of Bengal,

C. E. BUCKLAND,

Secretary to the Government of Bengal.

No. 5317Agri.

COPY forwarded to the Secretary to the Board of Revenue in the Land Revenue Department for information and guidance.

No. 5318Agri.

COPY, with a copy of the Report, submitted to the Secretary to the Government of India, Revenue and Agricultural Department, for information.

No. 5319Agri.

COPY forwarded to the Appointment Department of this Office for information.

No. 5320Agri.

COPY forwarded to the Director of the Department of Land Records and Agriculture, Bengal, for information and guidance.

By order of the Lieutenant-Governor of Bengal,

T. W. RICHARDSON,
Under-Secy. to the Govt. of Bengal.

CALCUTTA,
The 23rd December 1893.

C. E. G.—Reg. No. 6502C—772—29-12-93.

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